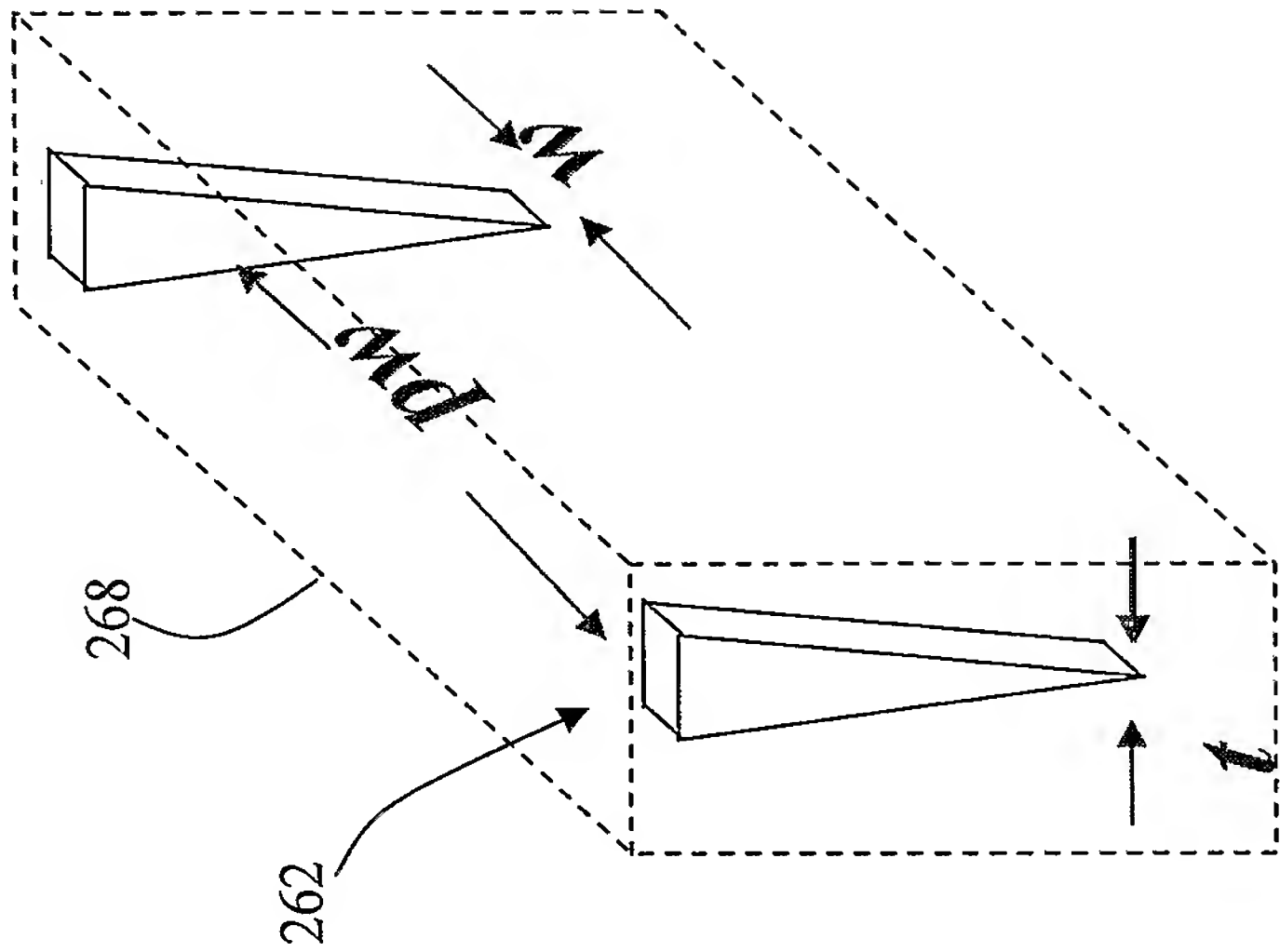
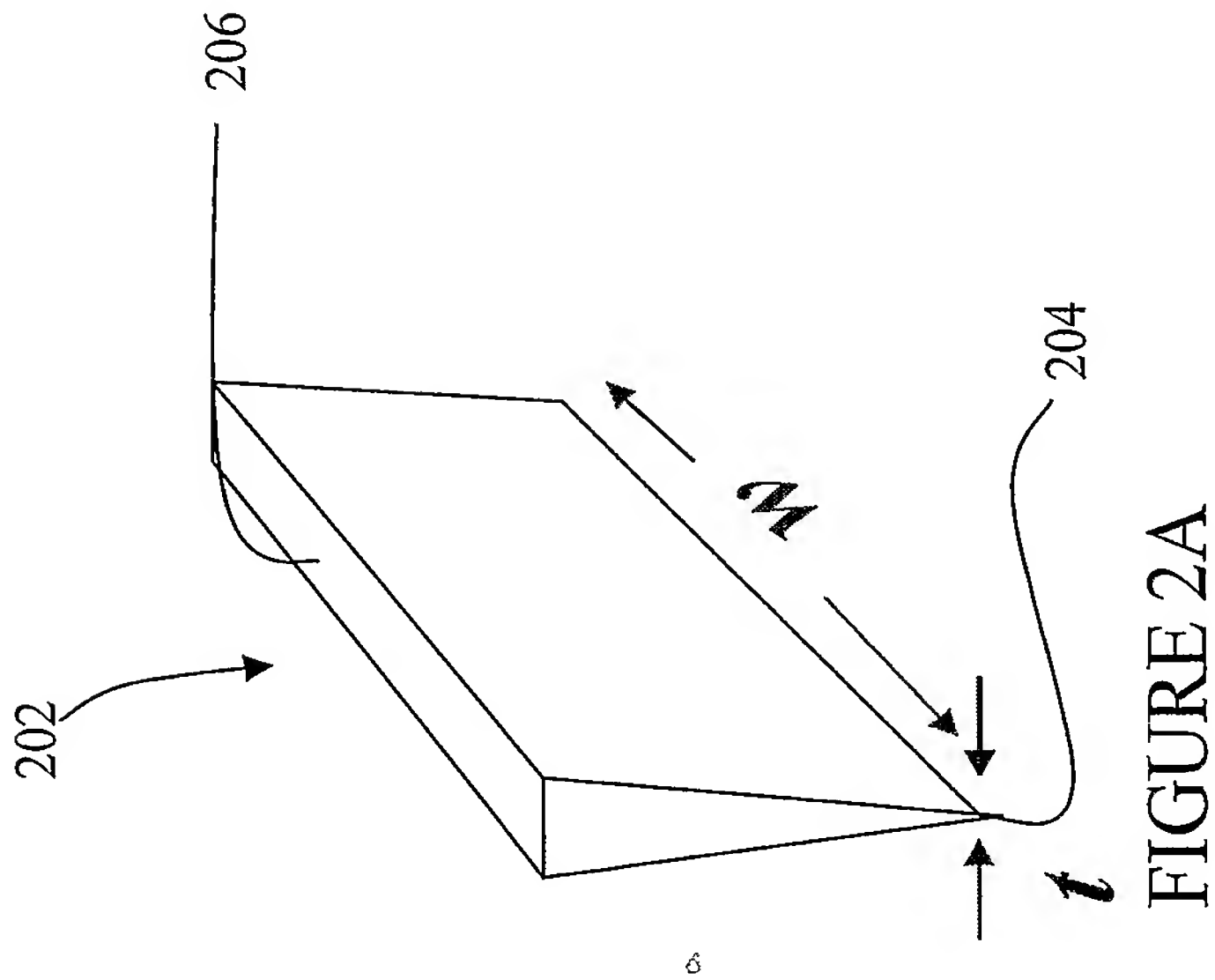
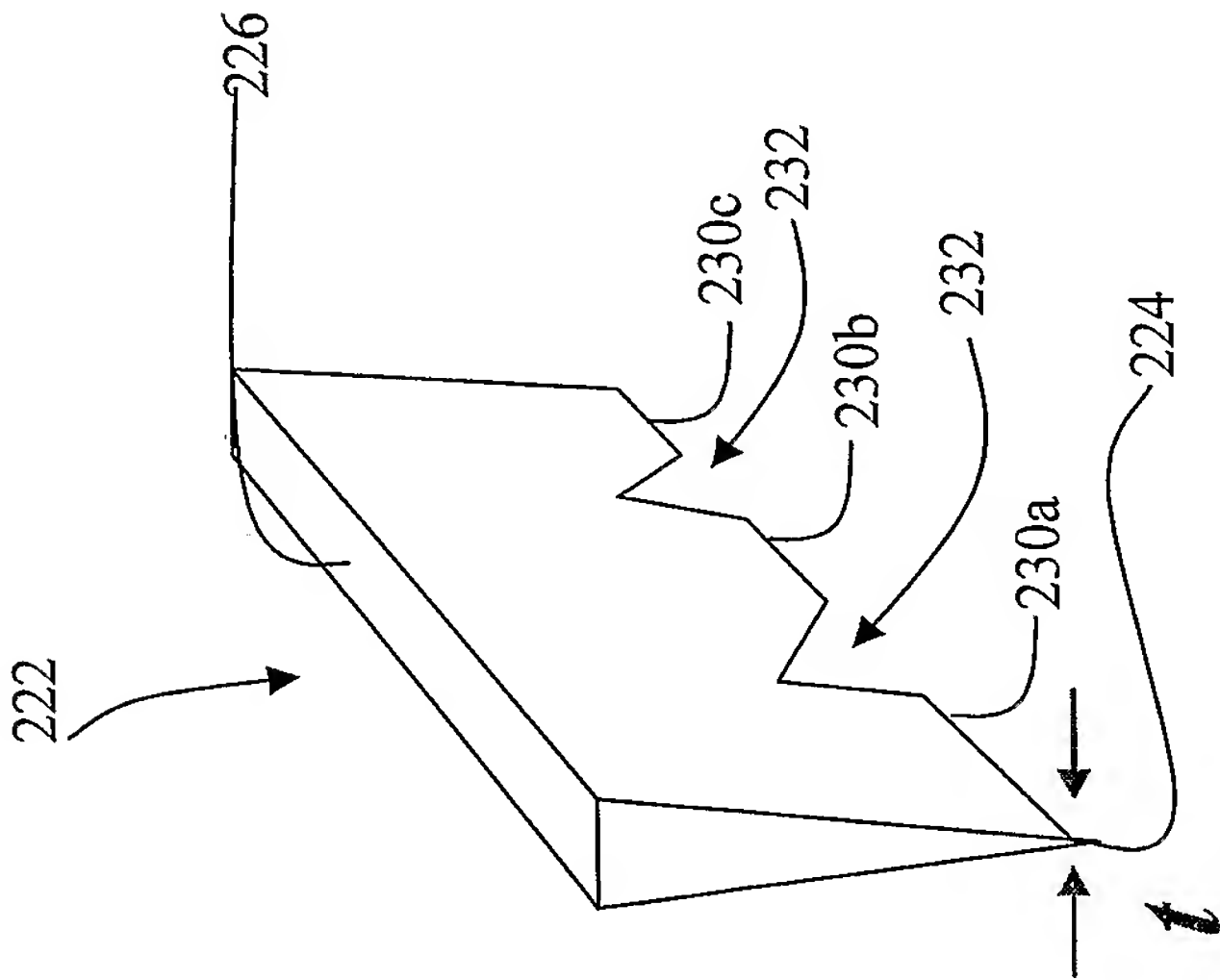
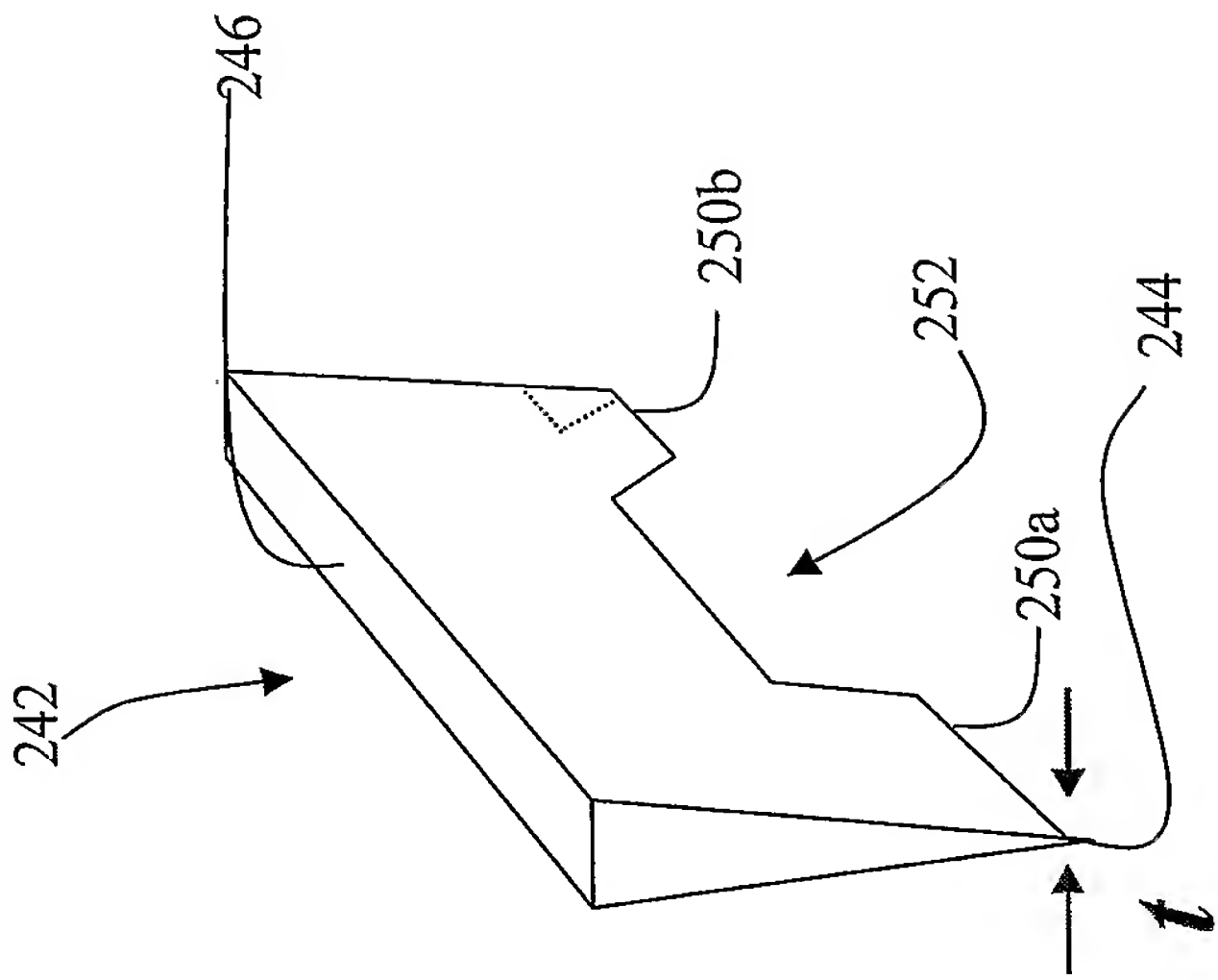


FIGURE 1





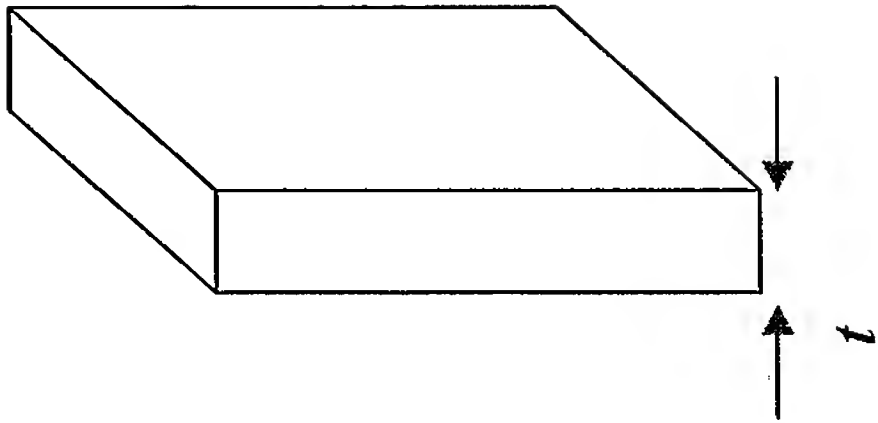


FIGURE 3D

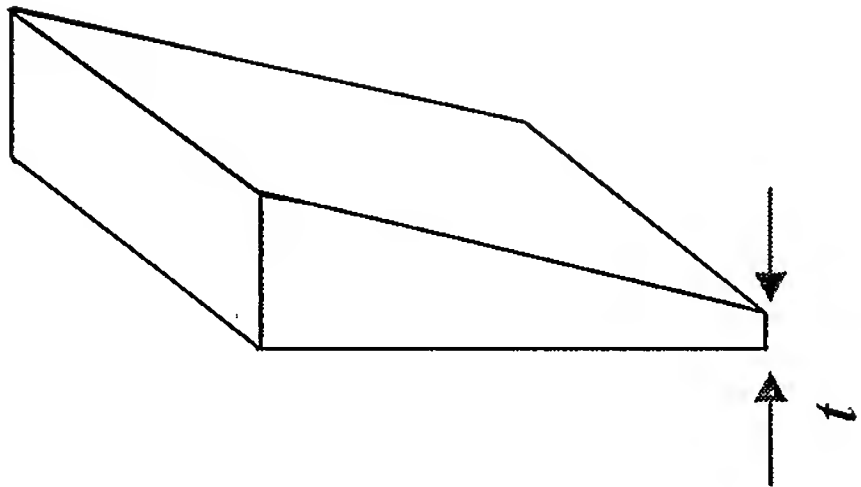


FIGURE 3B

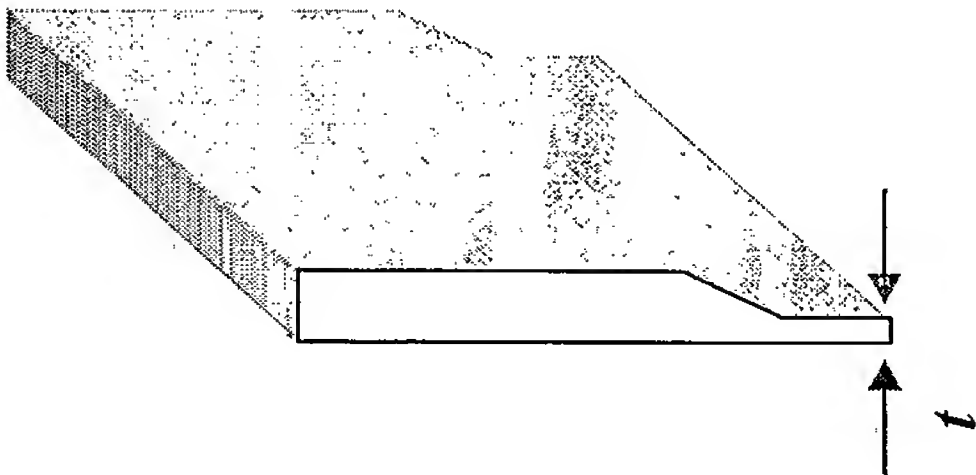


FIGURE 3A

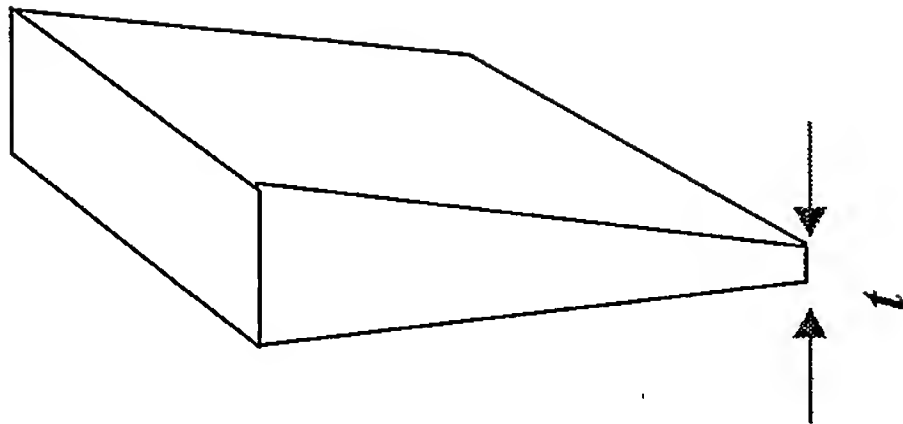


FIGURE 3C

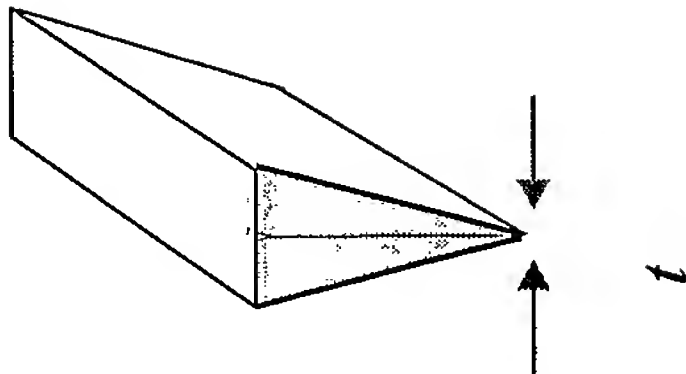


FIGURE 3E

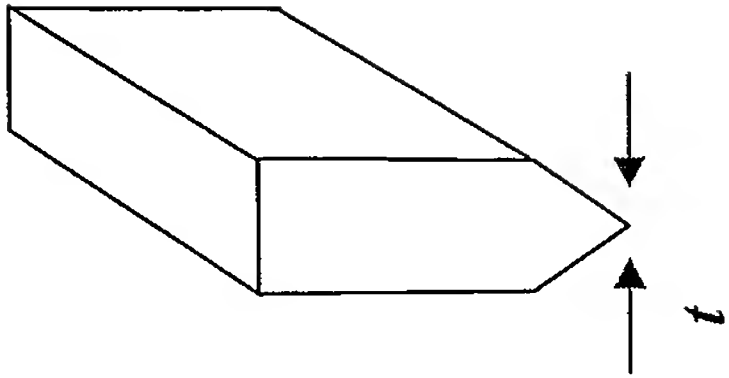


FIGURE 3F

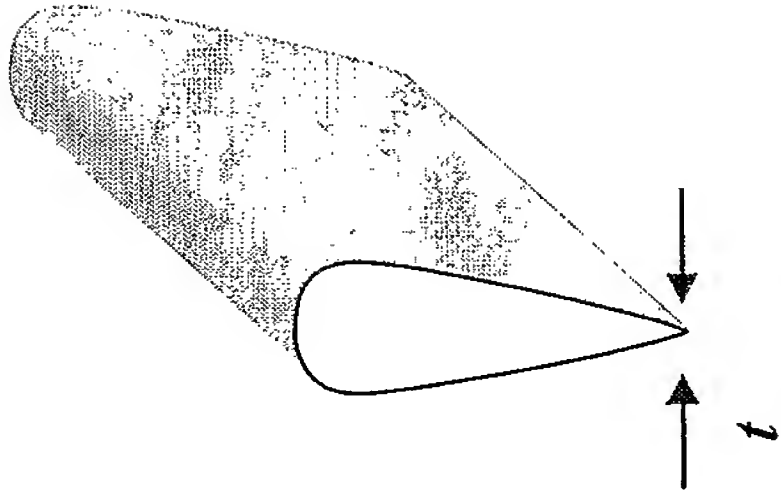


FIGURE 3H

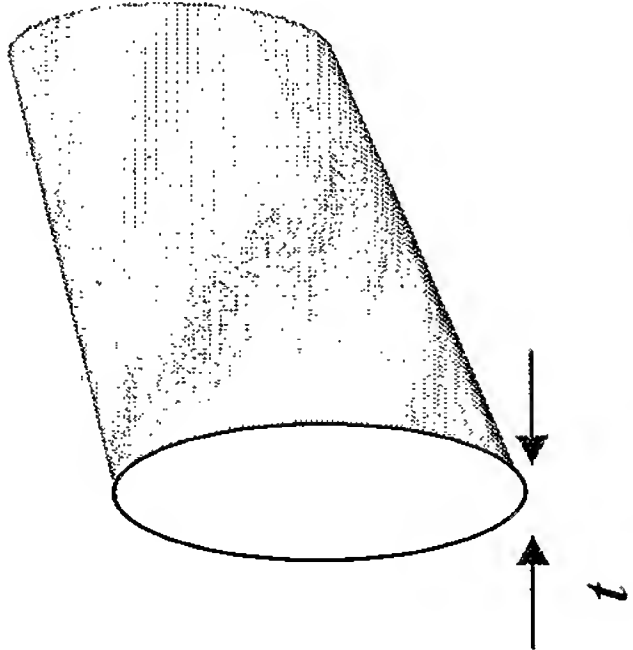


FIGURE 3J

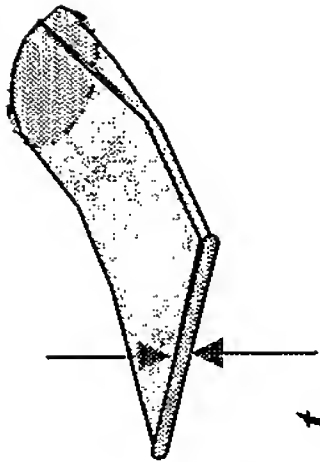


FIGURE 3K

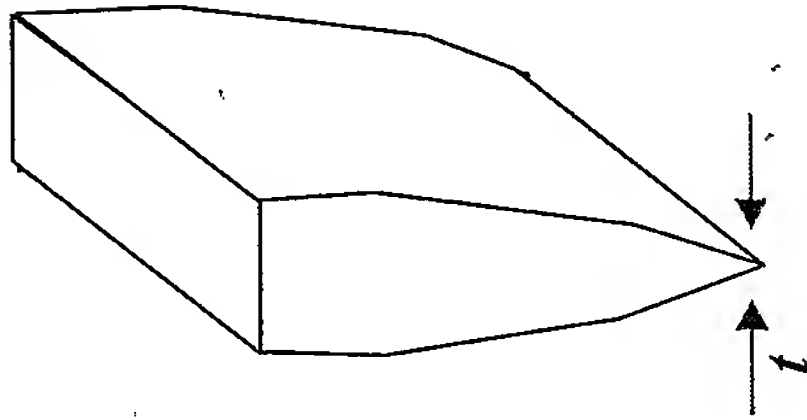


FIGURE 3G

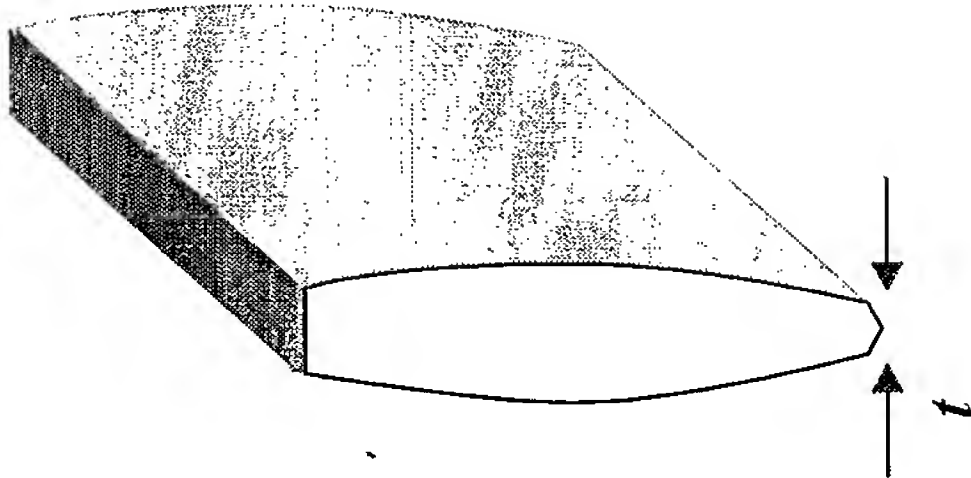


FIGURE 3I



FIGURE 3L

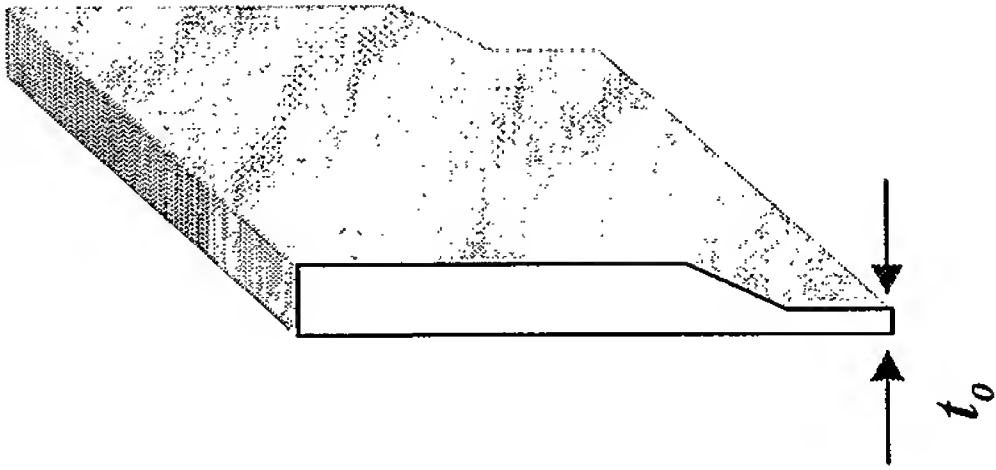


FIGURE 4A

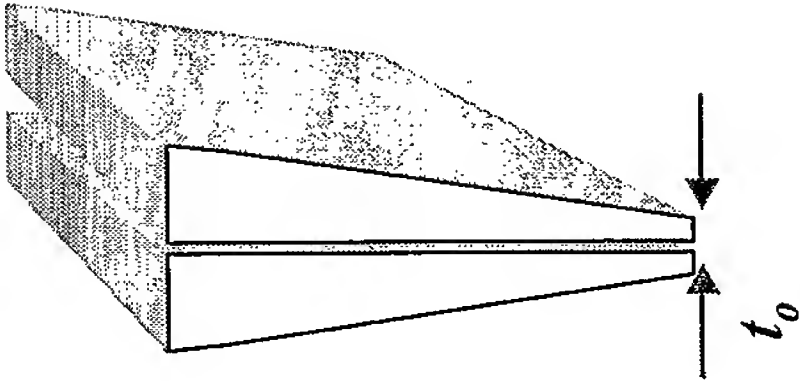


FIGURE 4C

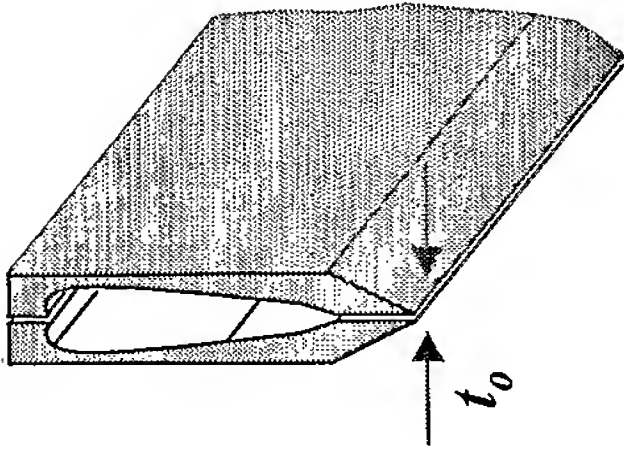


FIGURE 4E

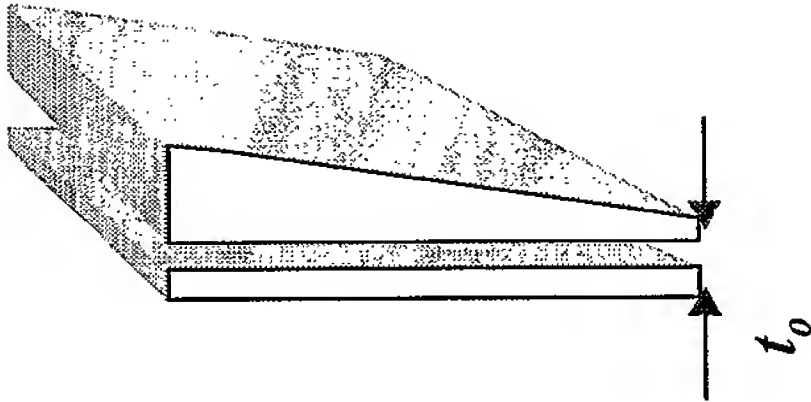


FIGURE 4B

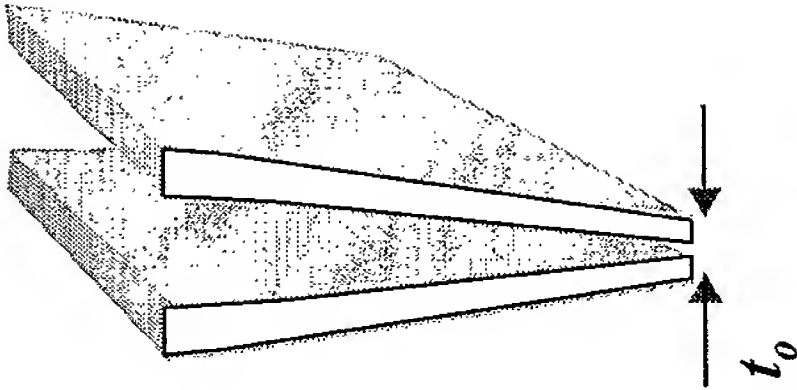


FIGURE 4D

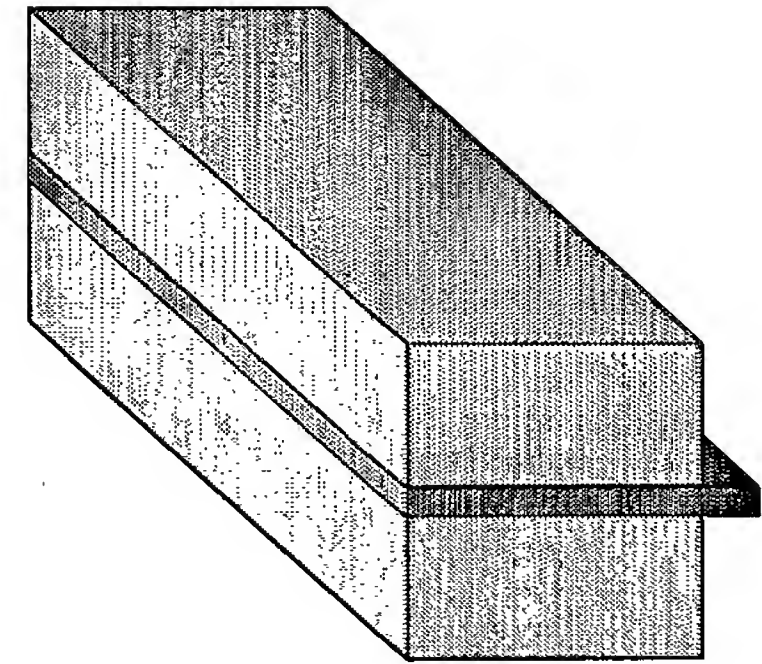
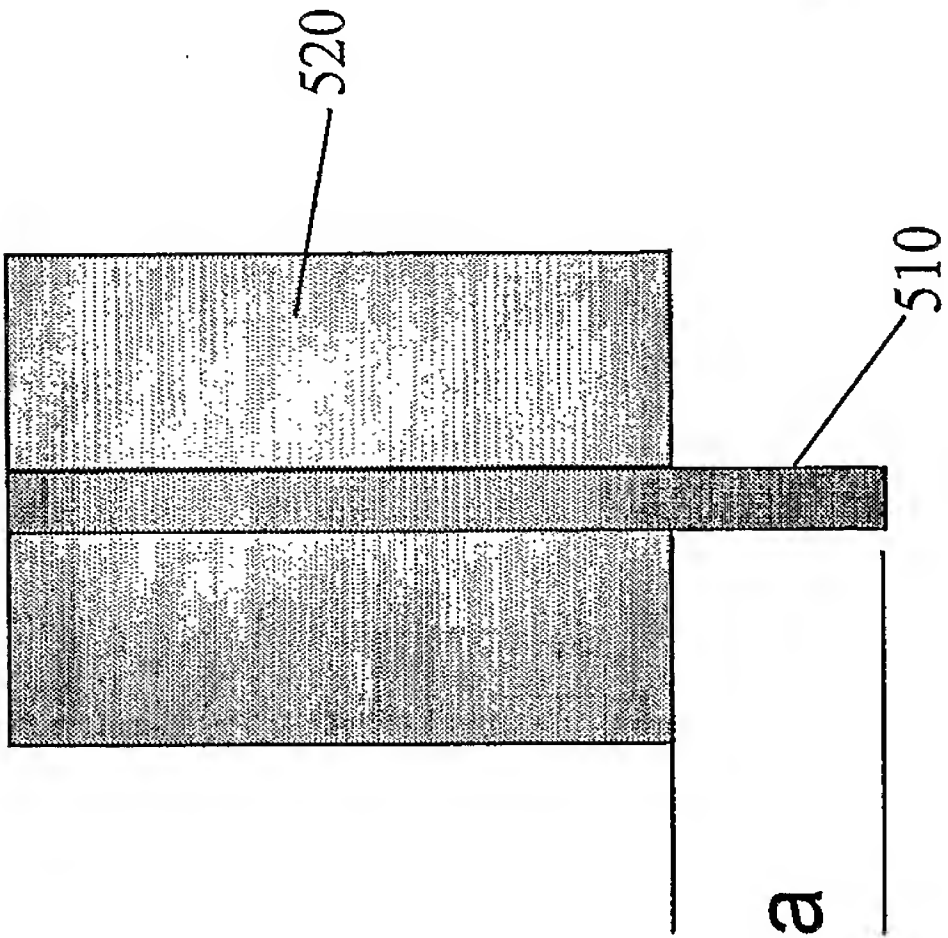
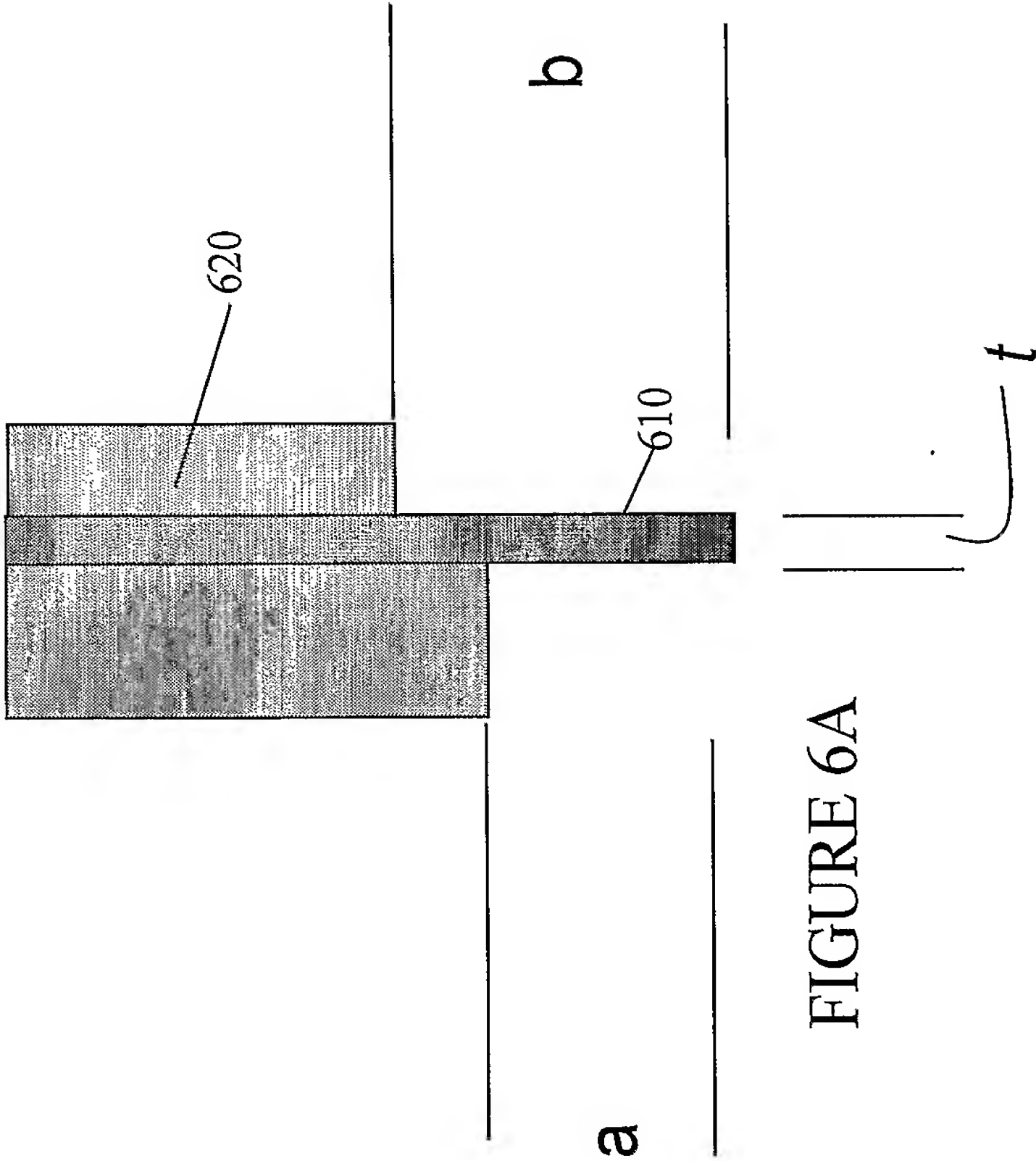


FIGURE 5B

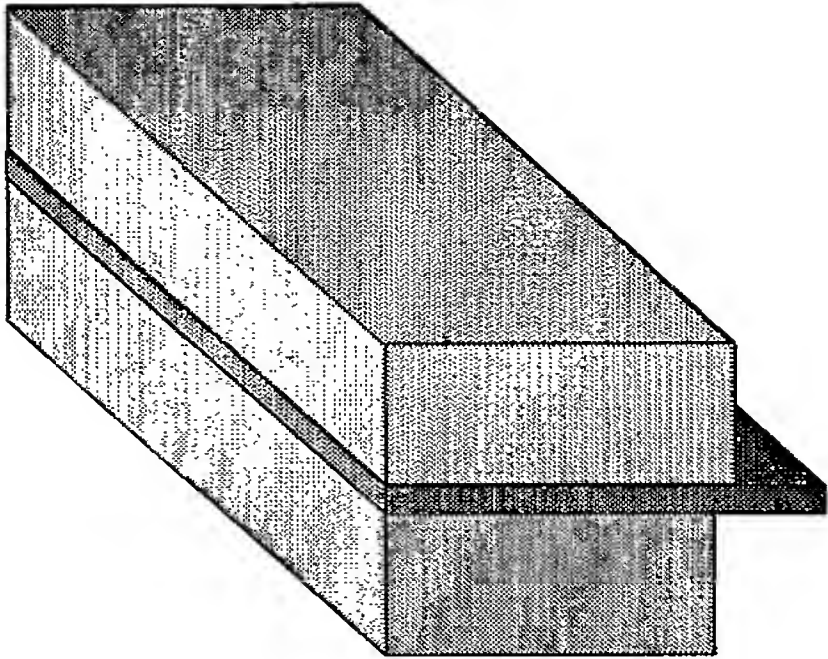


FIGURE 6B

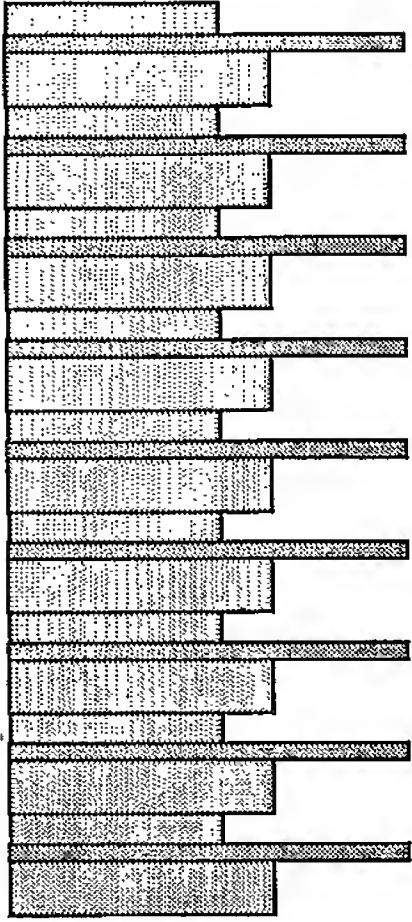


FIGURE 7

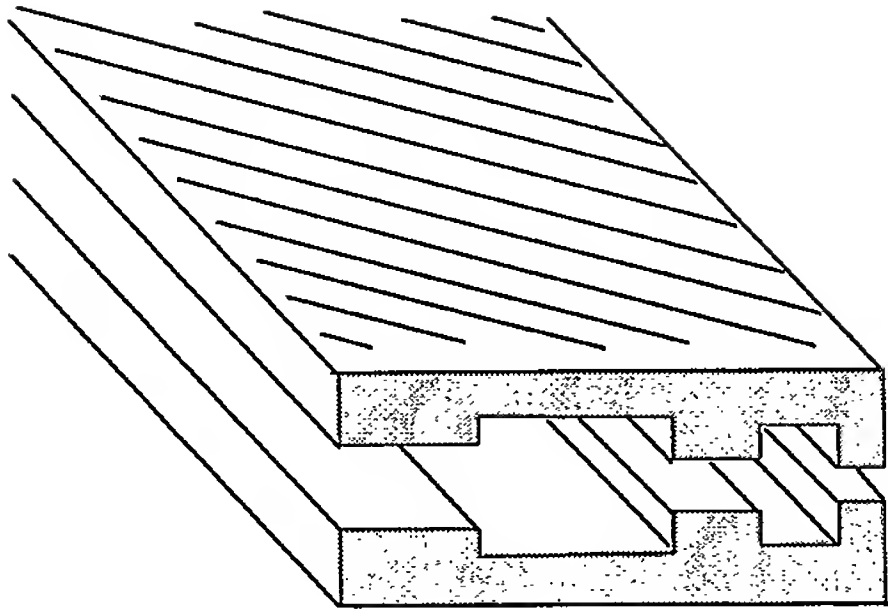


FIGURE 8A

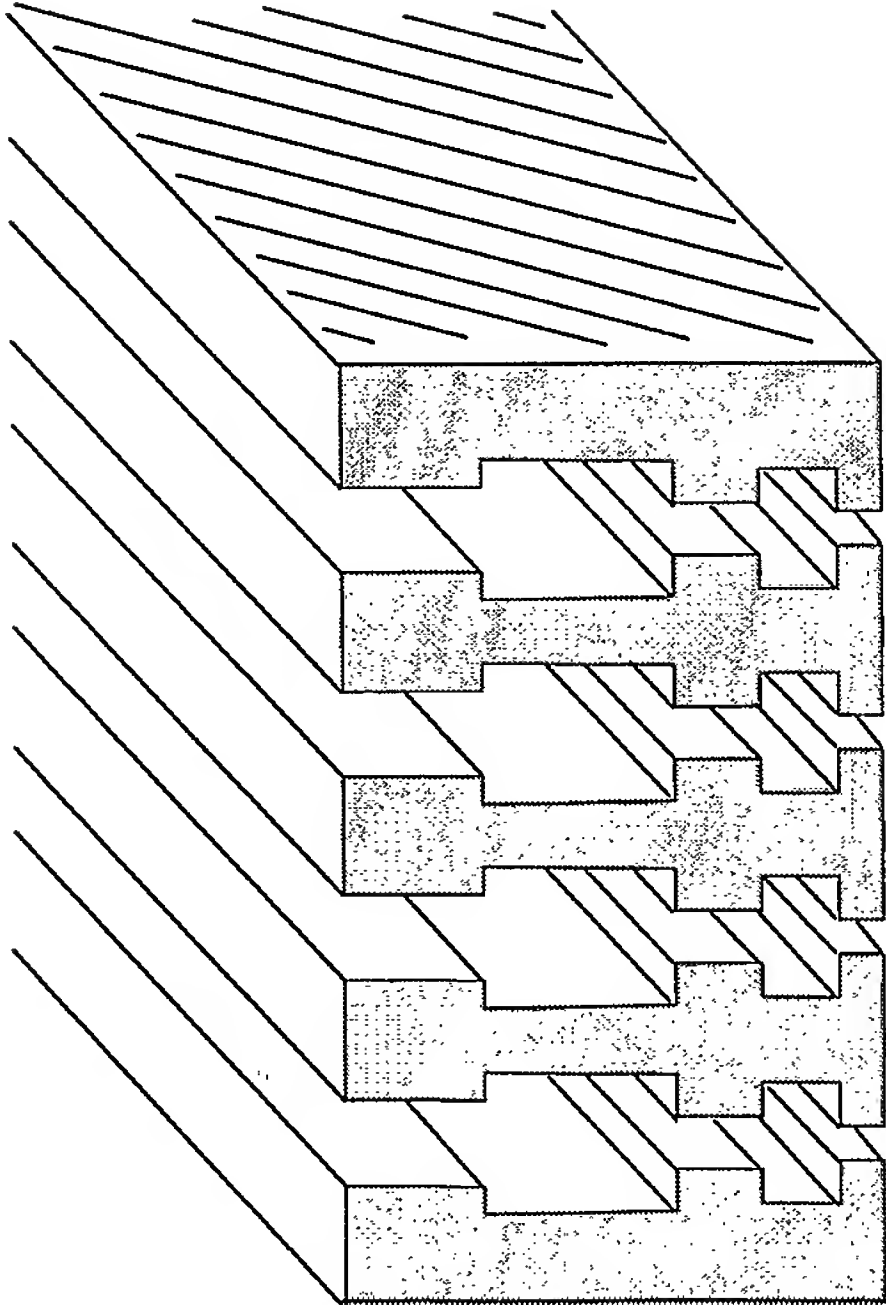


FIGURE 8B

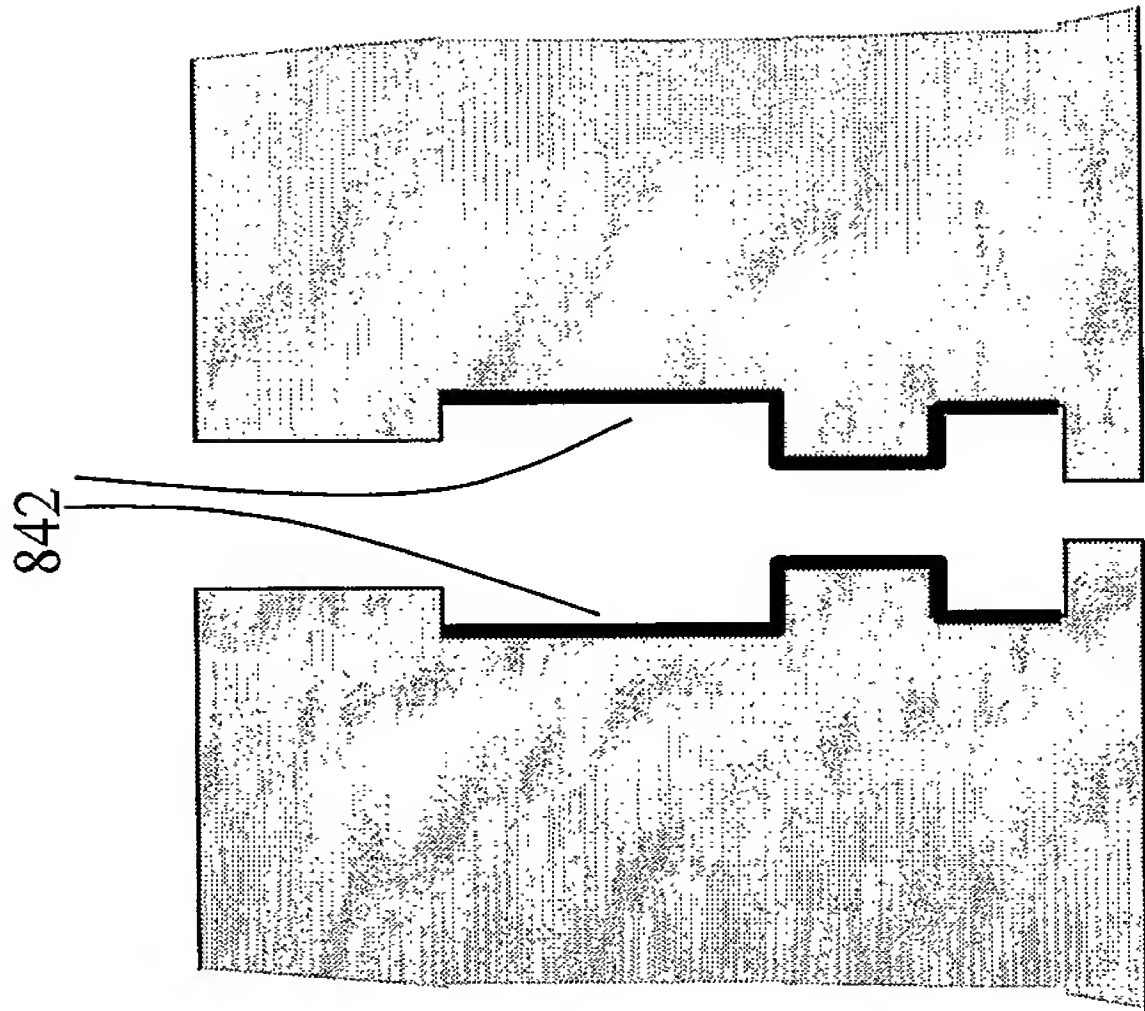


FIGURE 8C

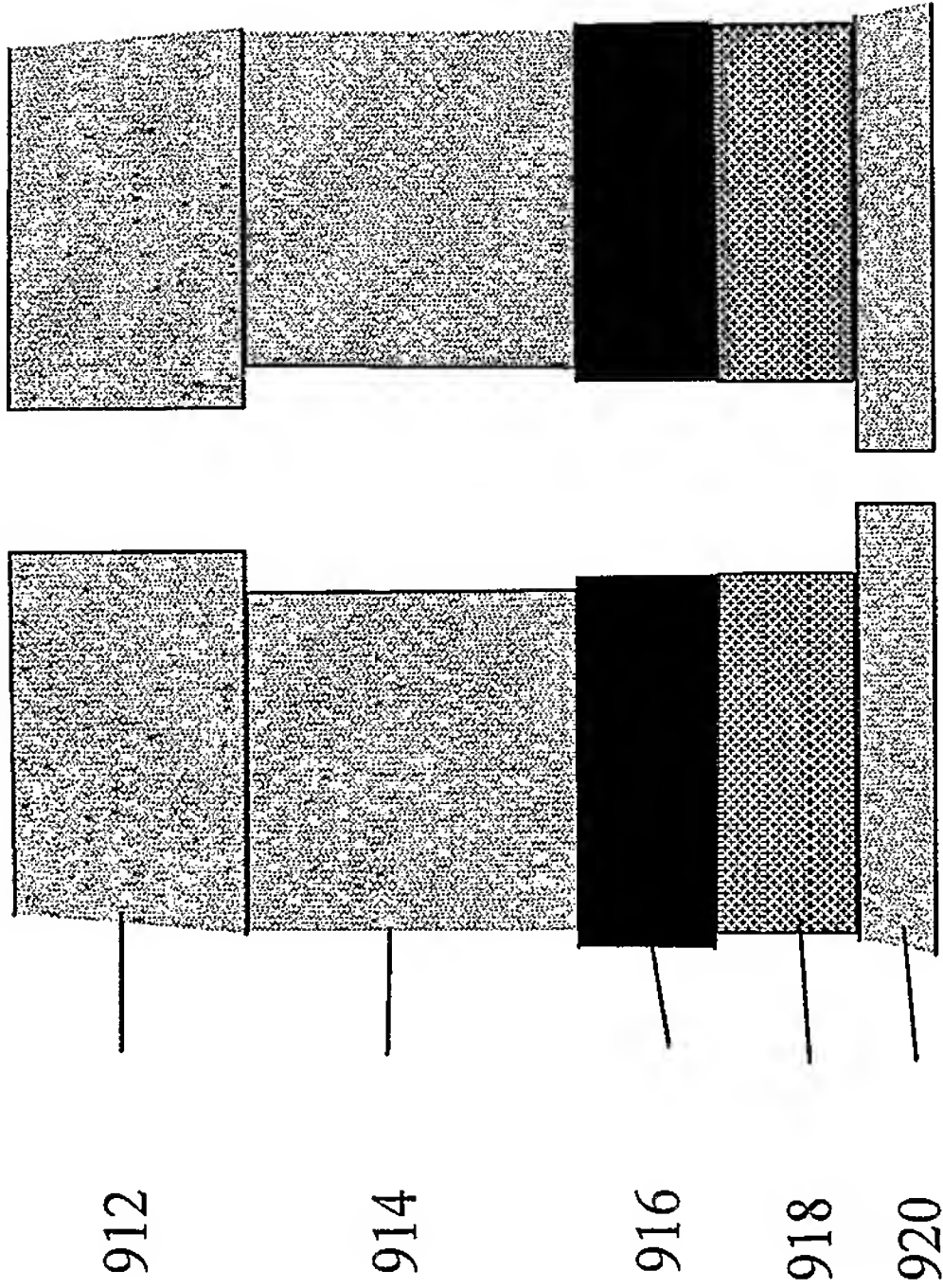


FIGURE 9A

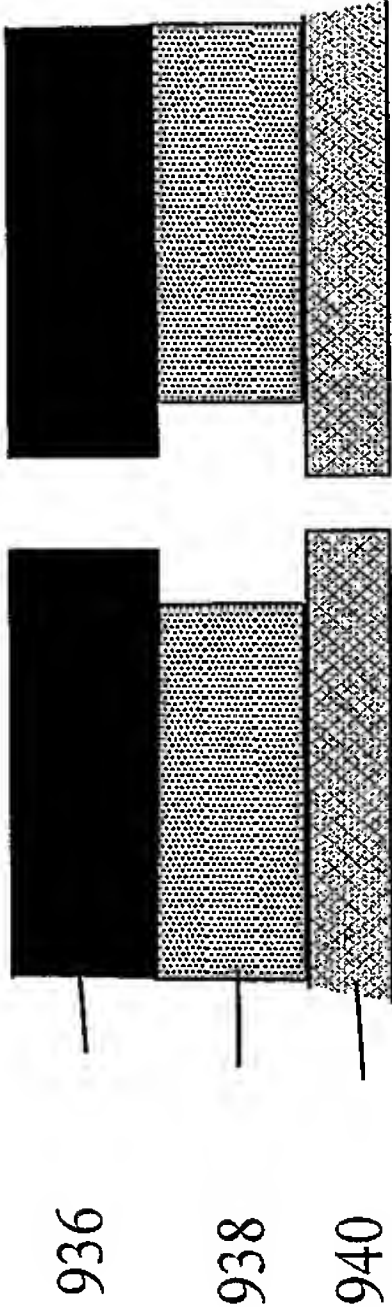
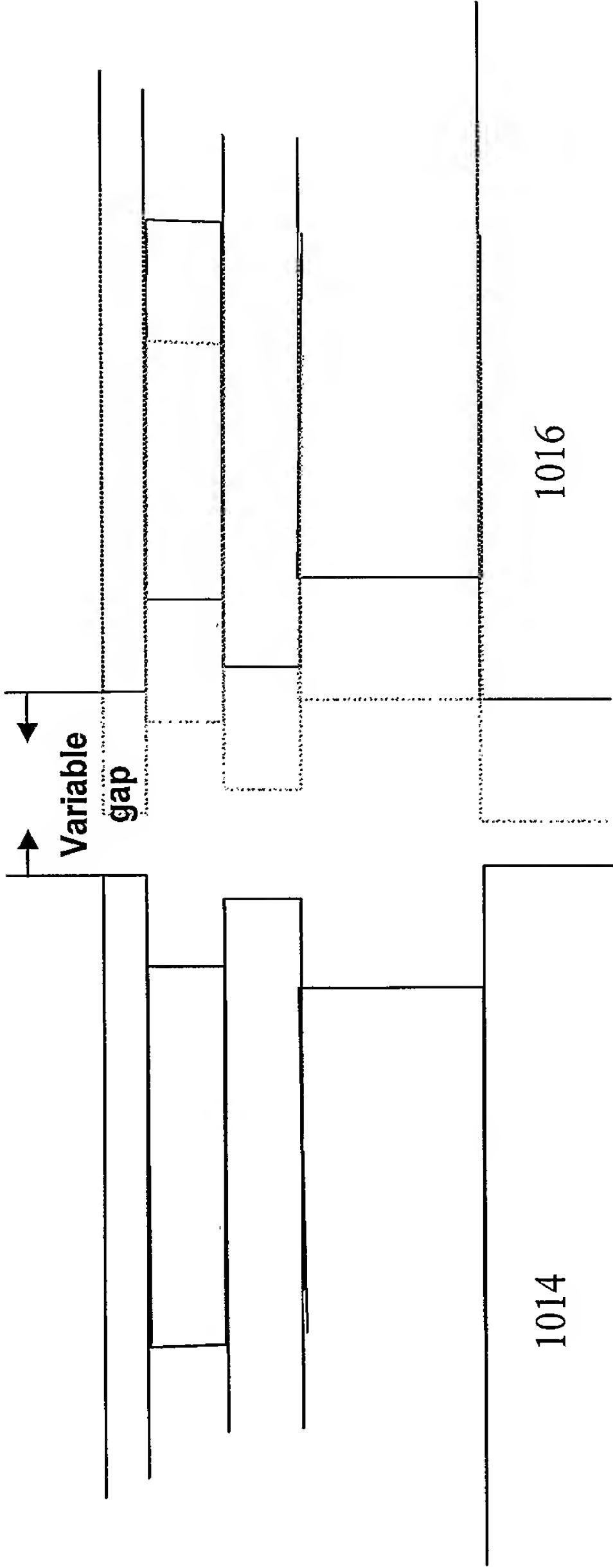


FIGURE 9B

1010

1012



1014

1016

FIGURE 10A

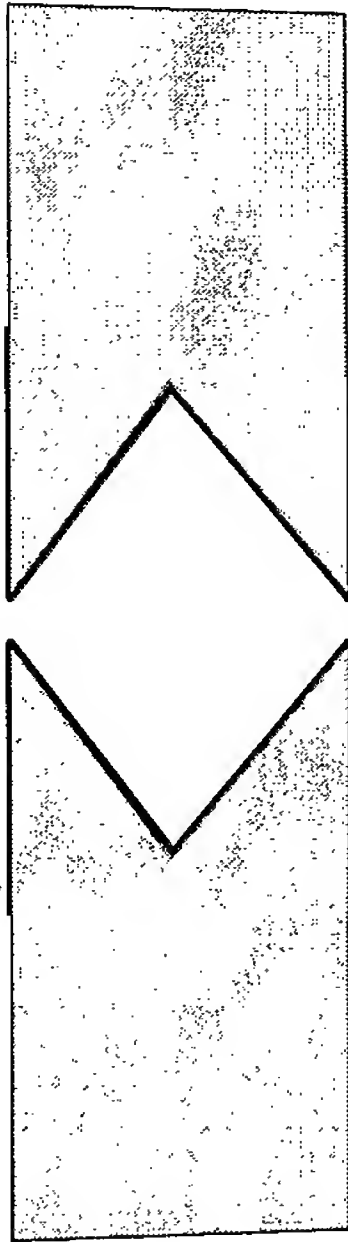


FIGURE 10B1

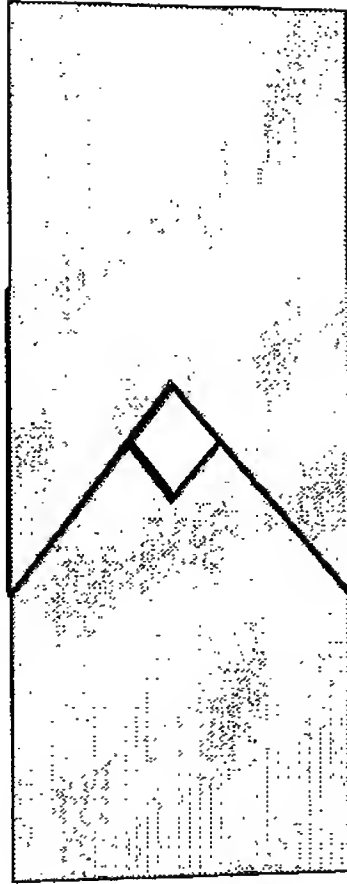


FIGURE 10B2

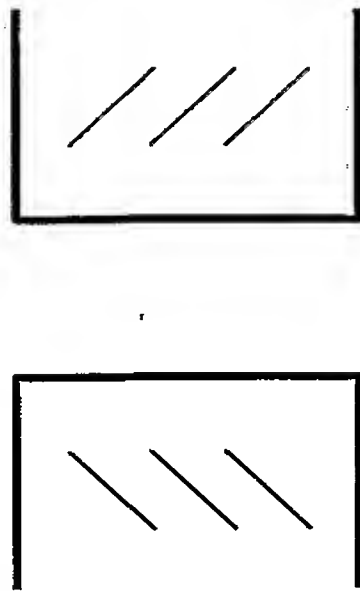


FIGURE 10C1

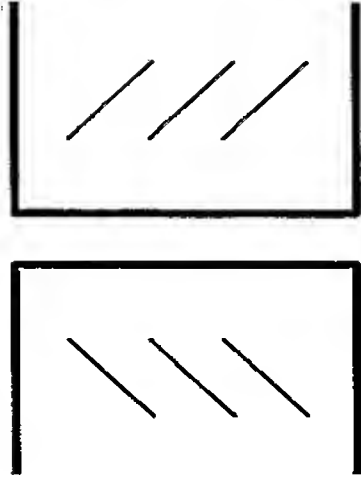
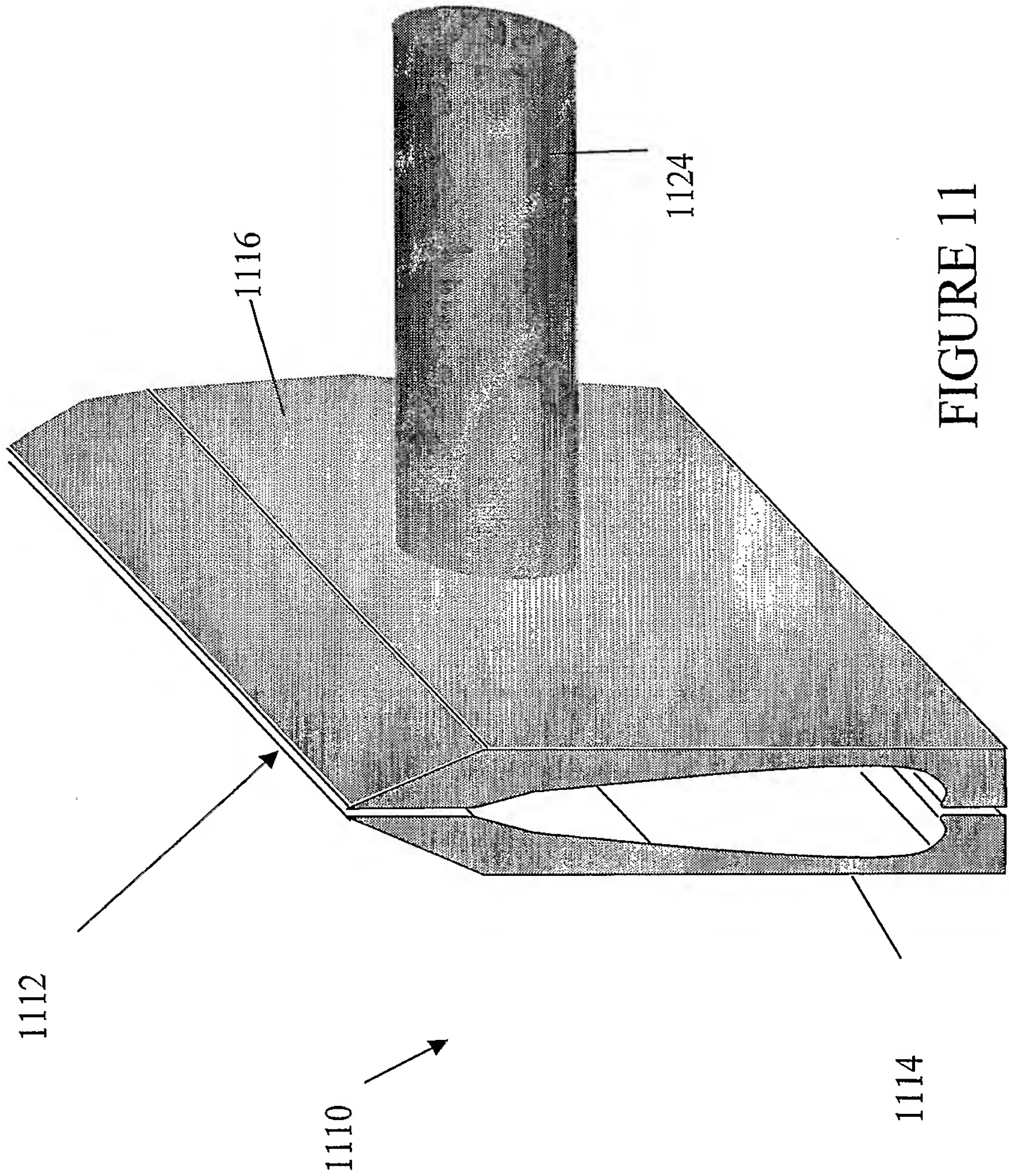


FIGURE 10C2



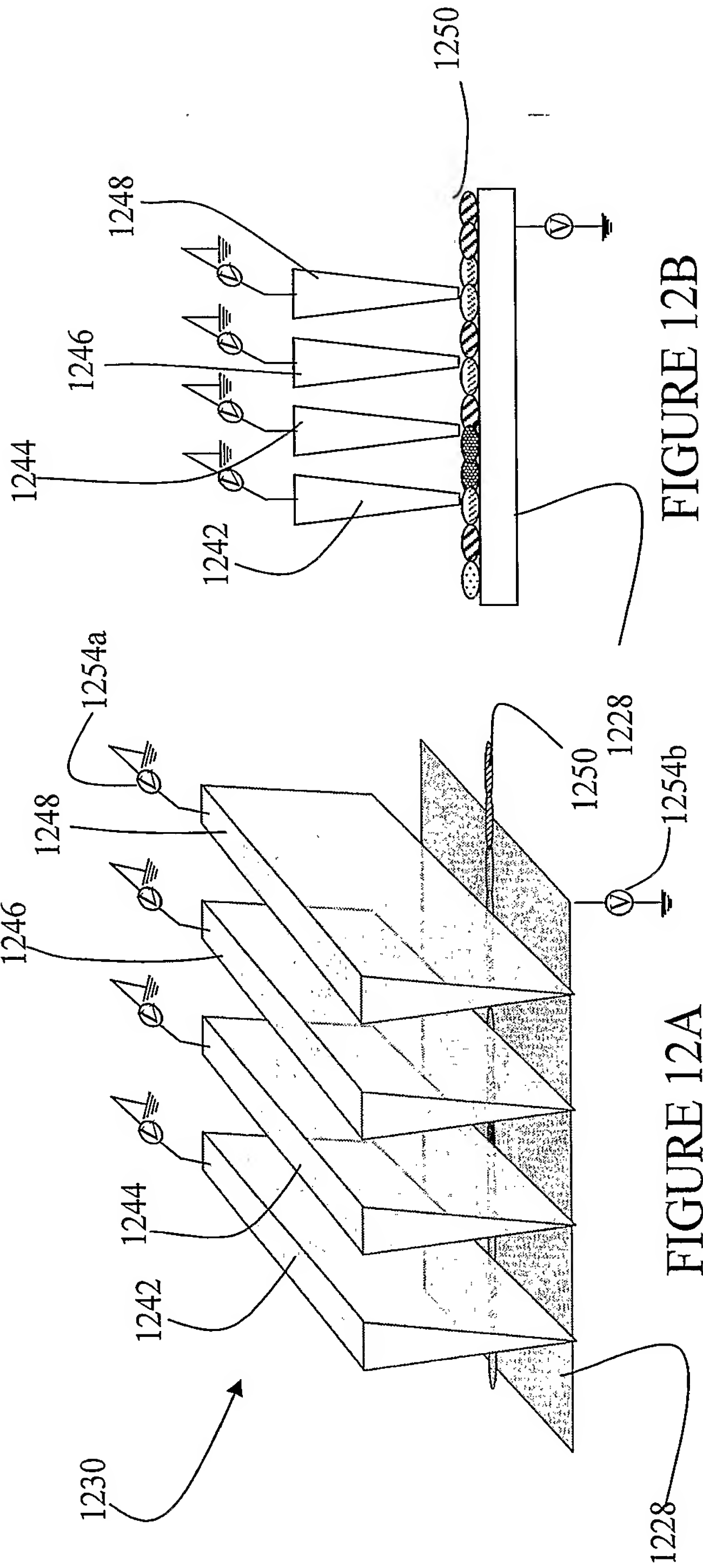


FIGURE 12B

FIGURE 12A

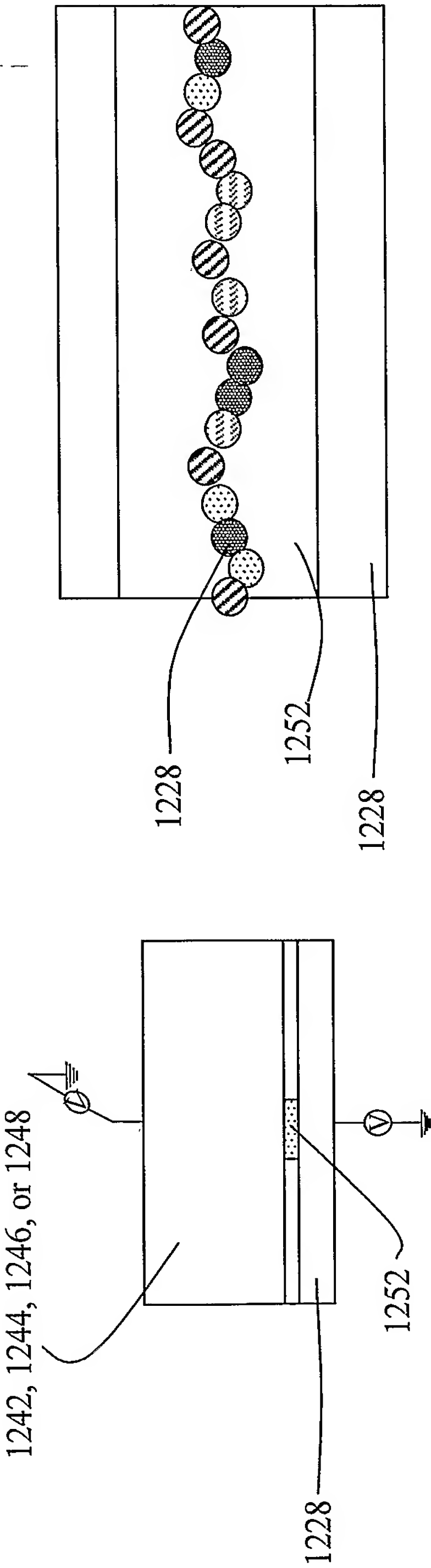


FIGURE 12D

FIGURE 12C

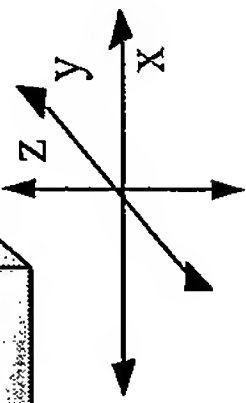
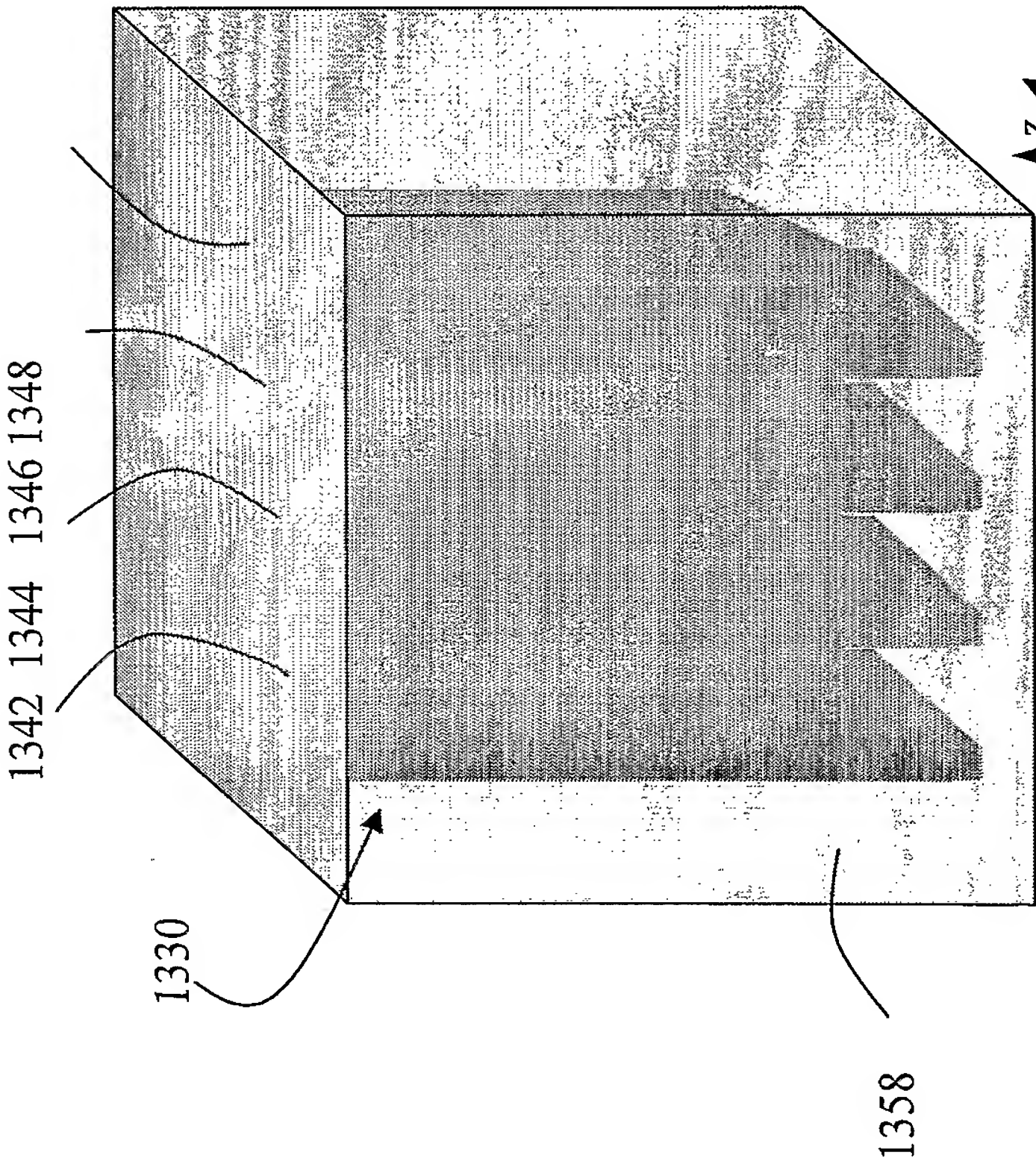
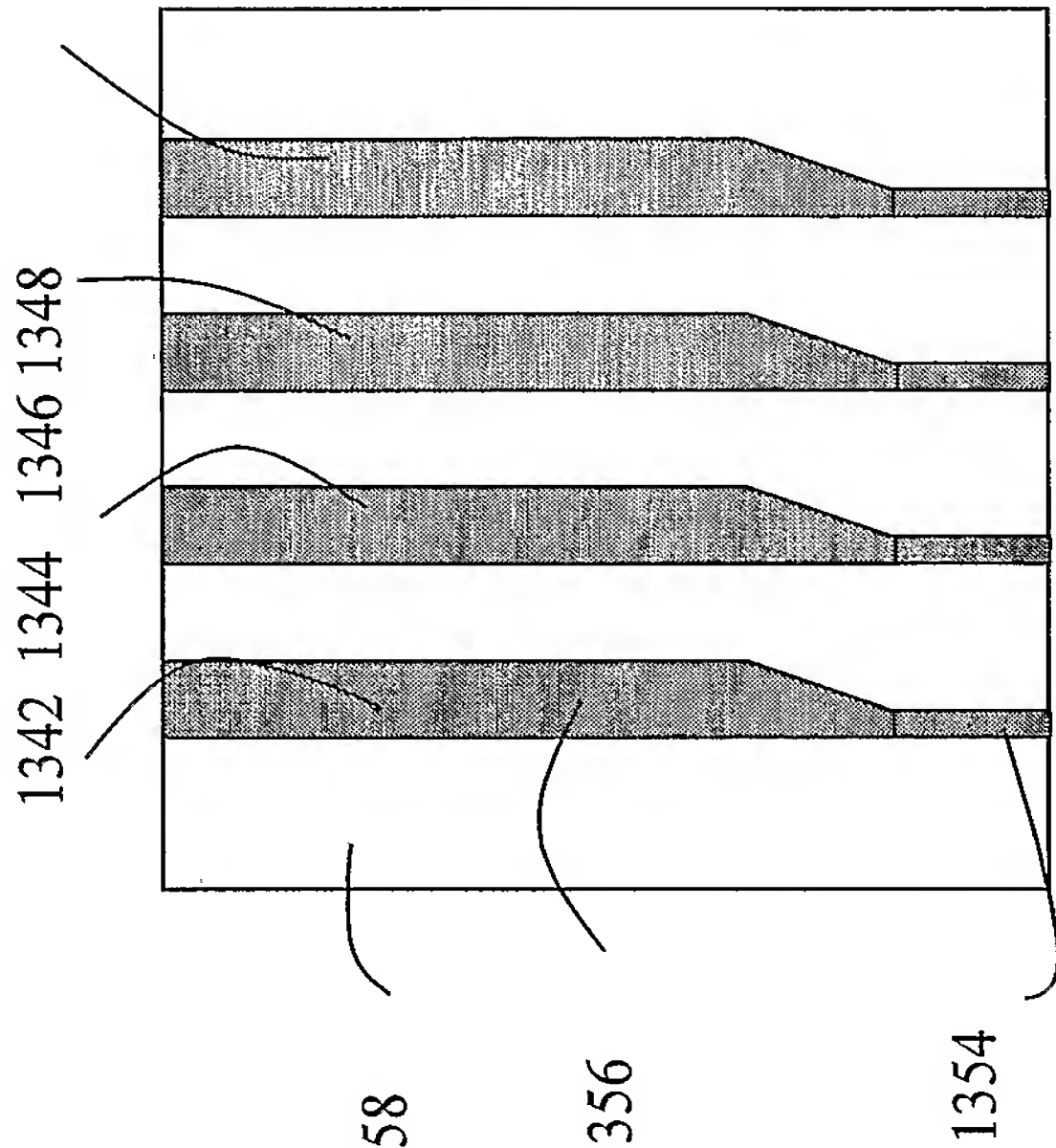
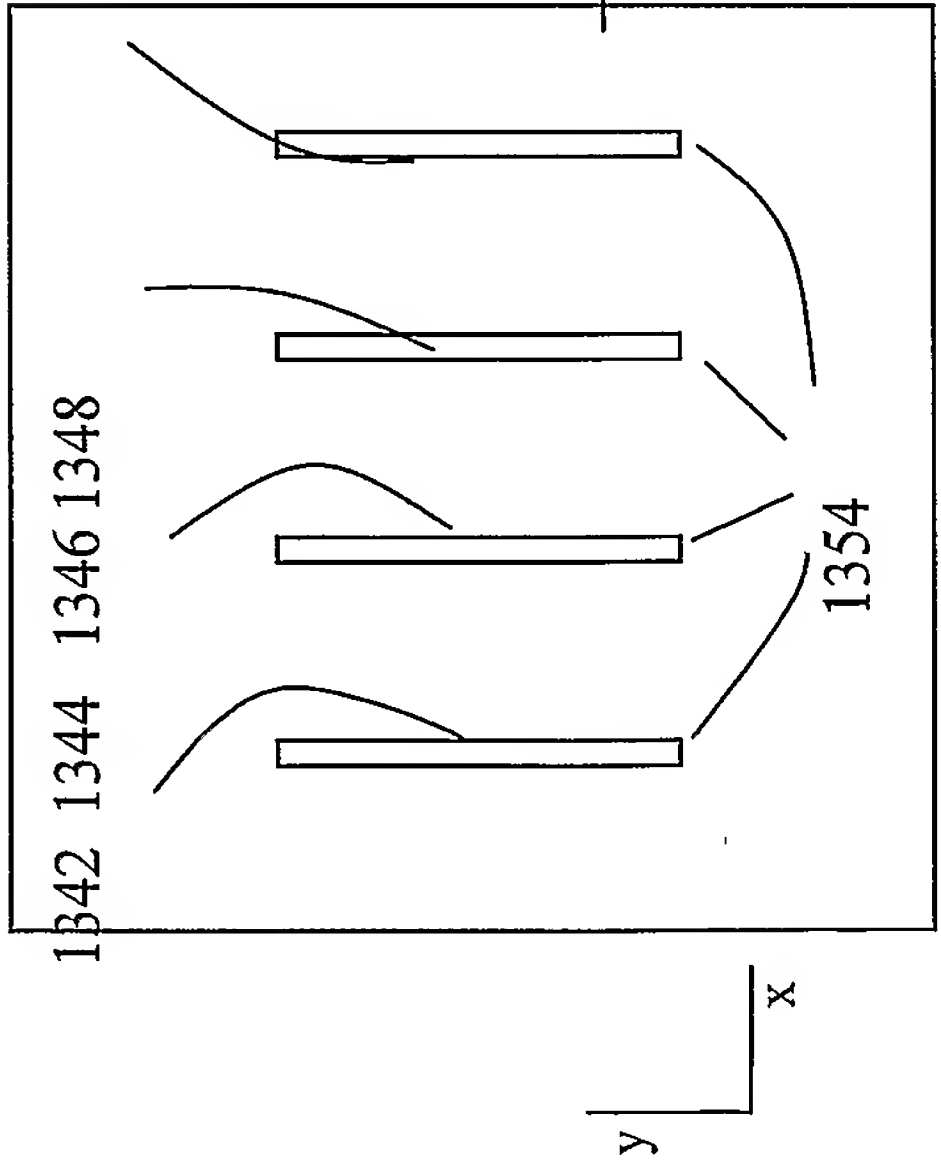
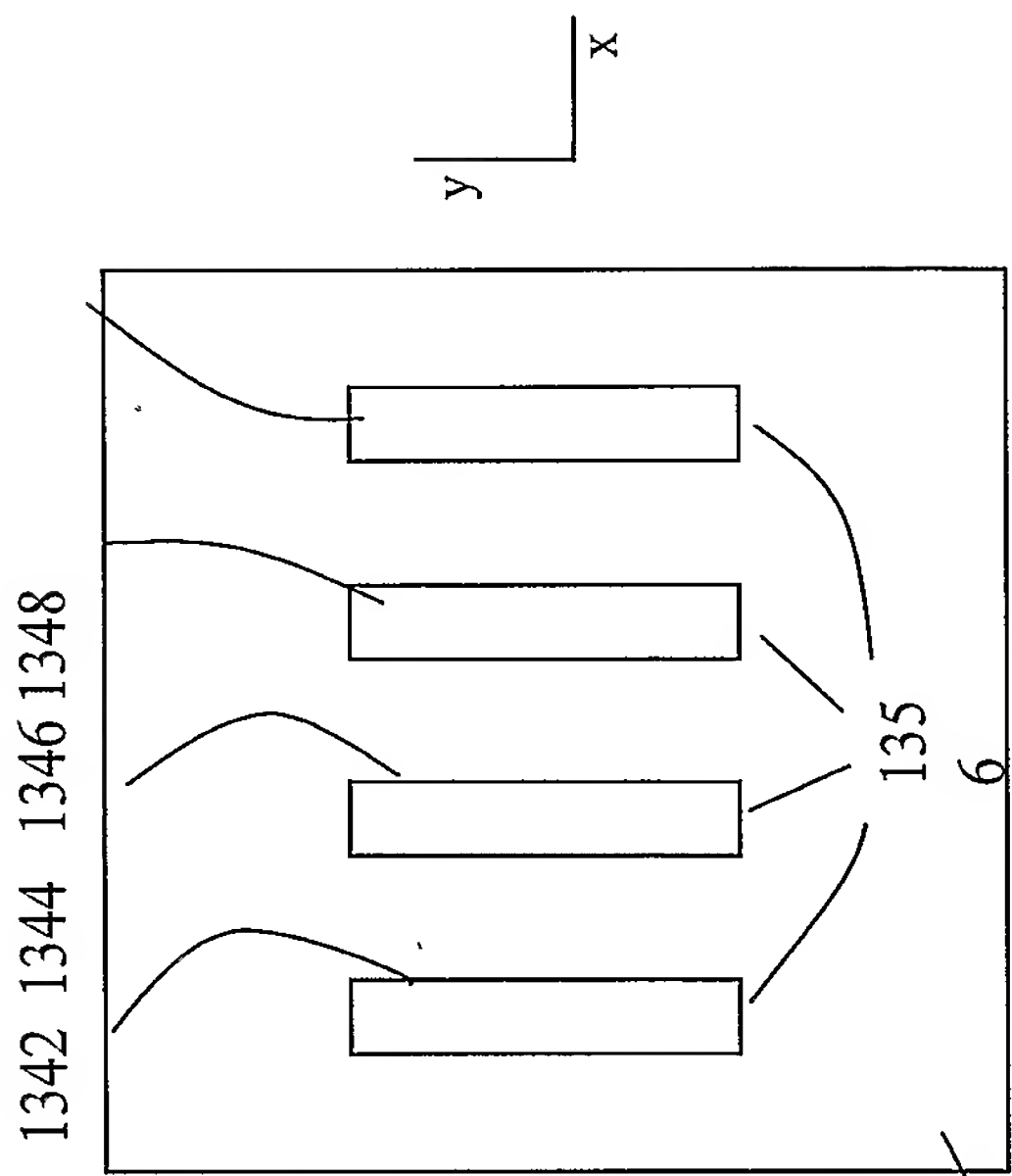


FIGURE 13A



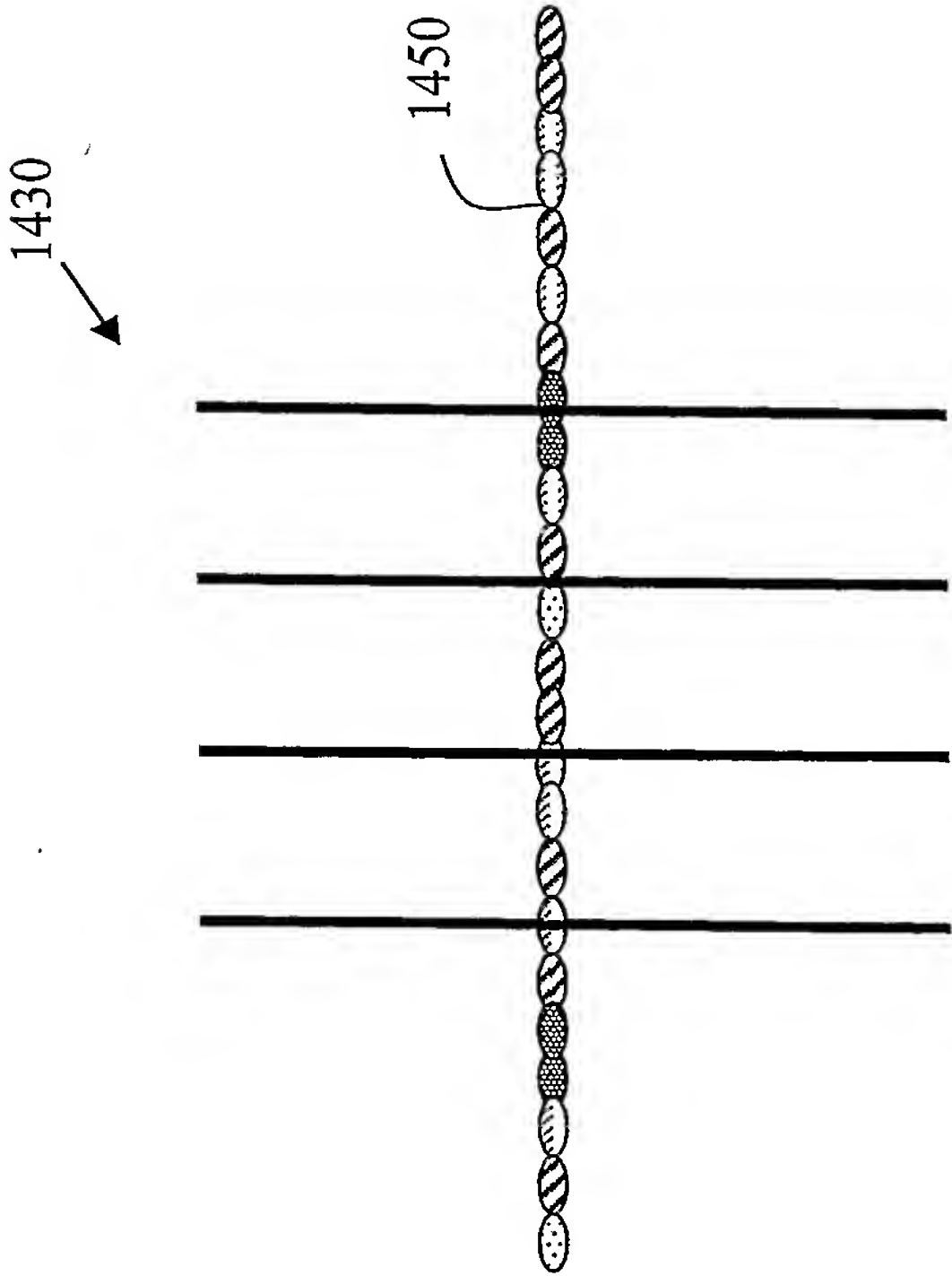


FIGURE 14A

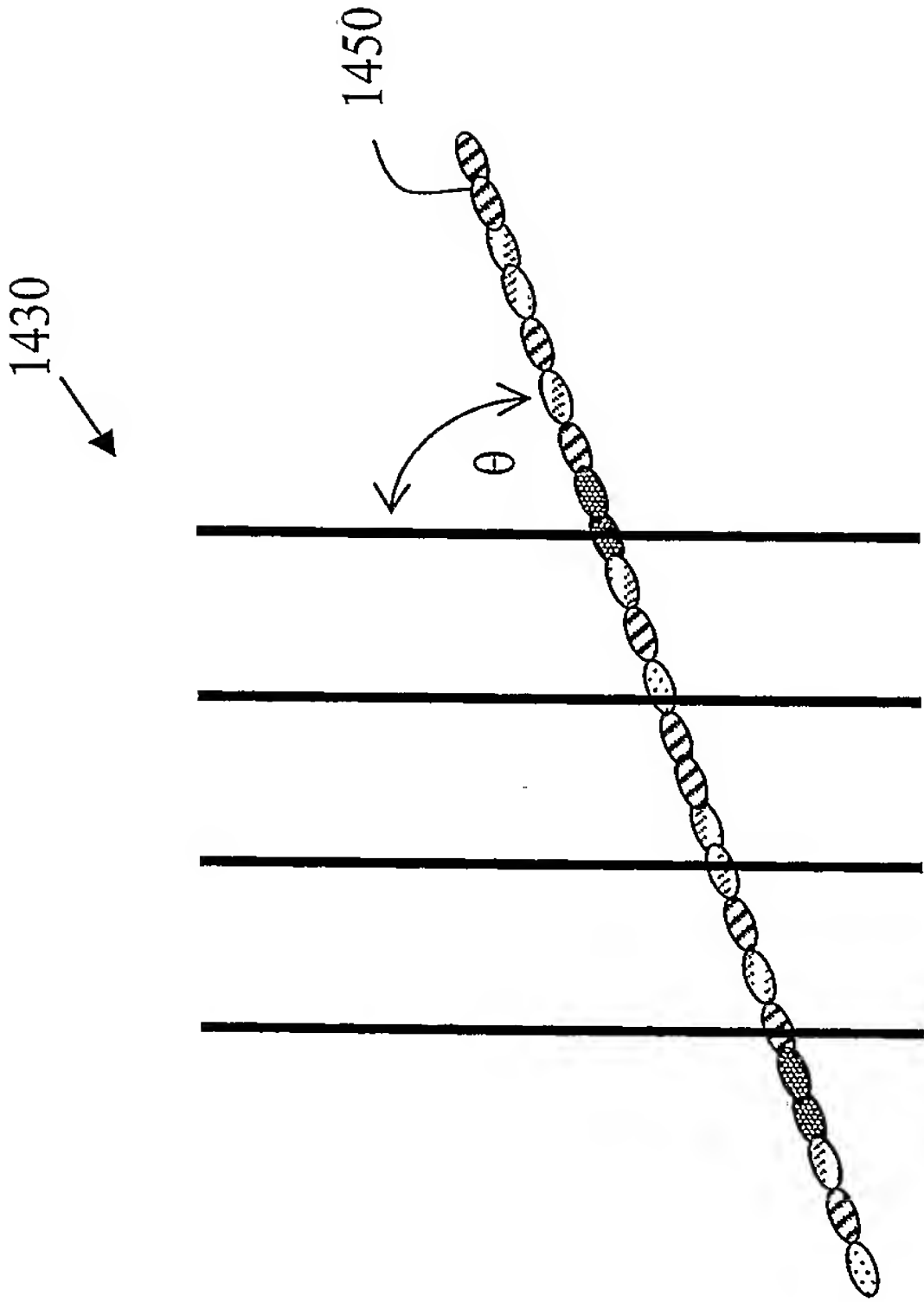


FIGURE 14B

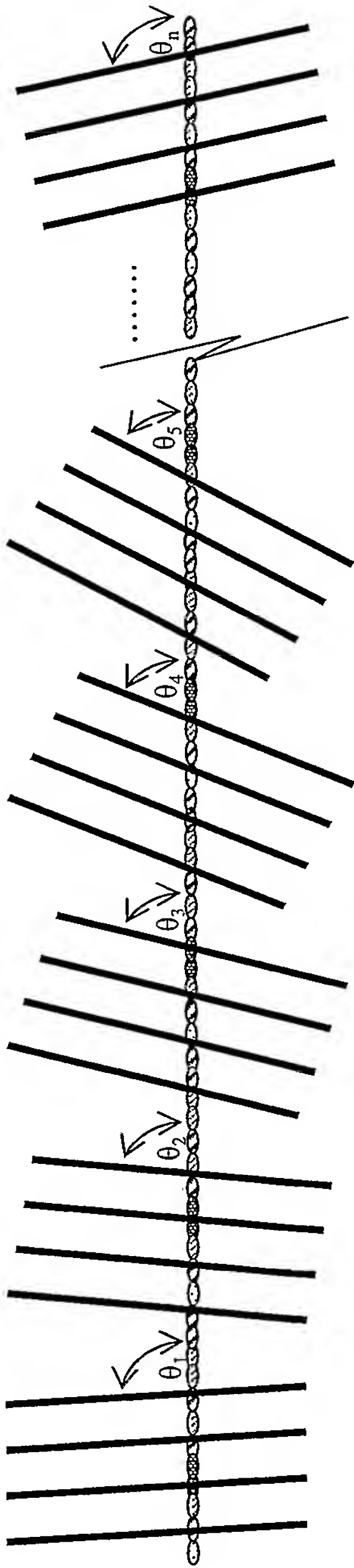


FIGURE 14C

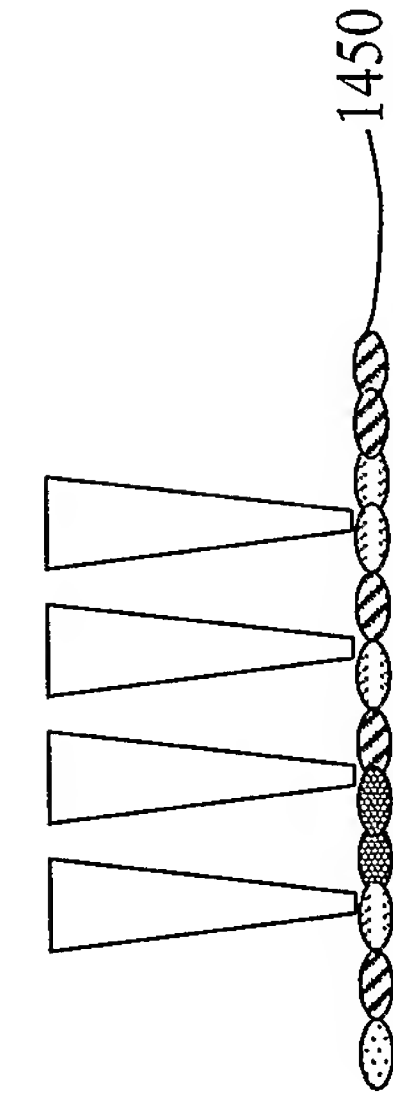


FIGURE 14D

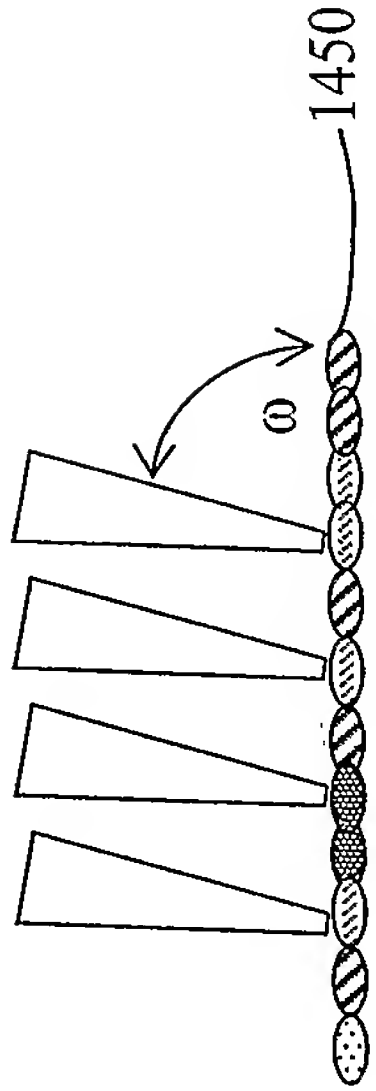


FIGURE 14E

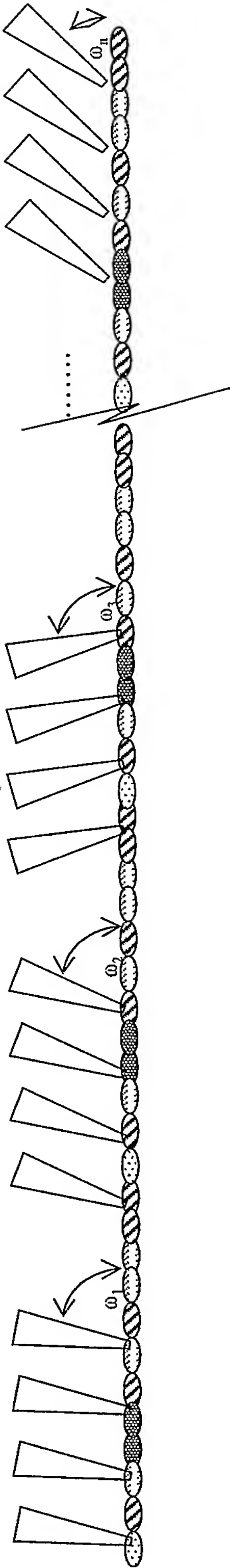


FIGURE 14F

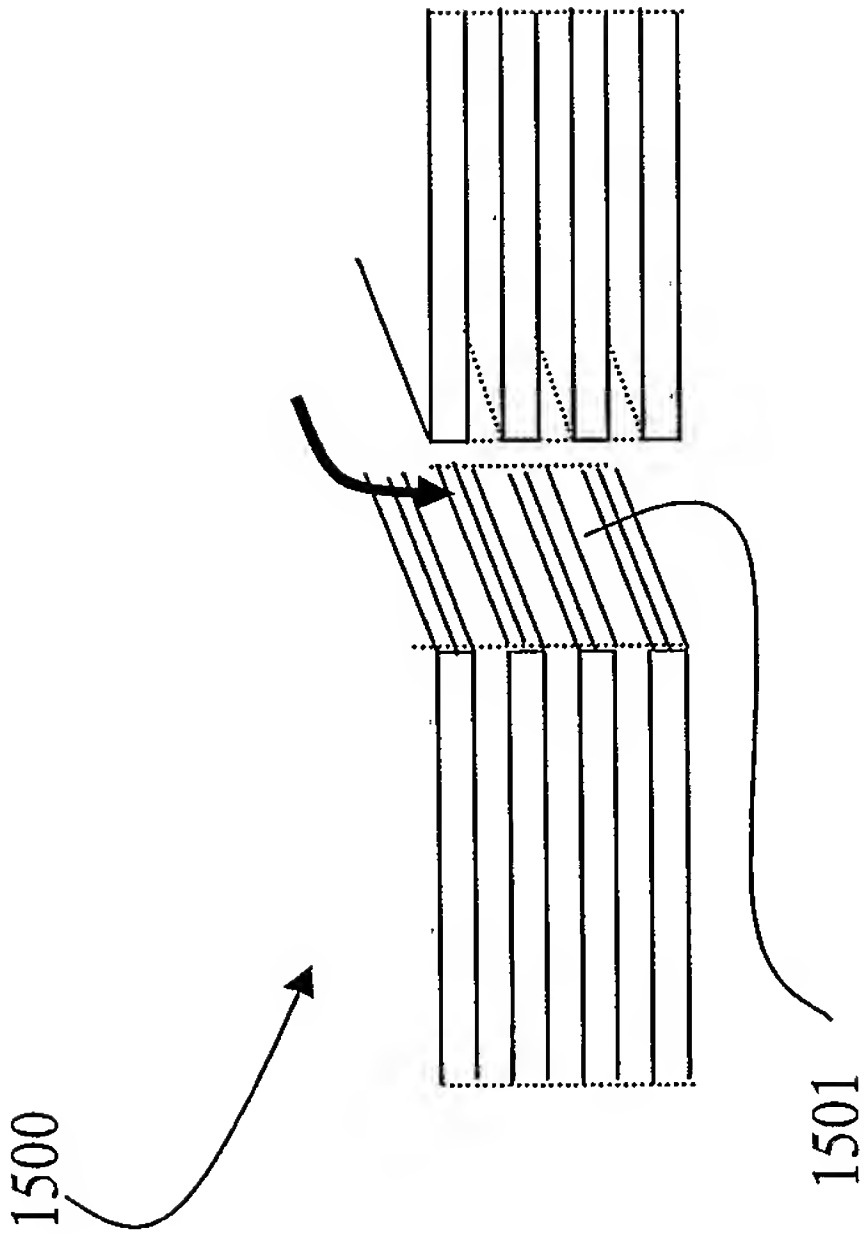


FIGURE 15A

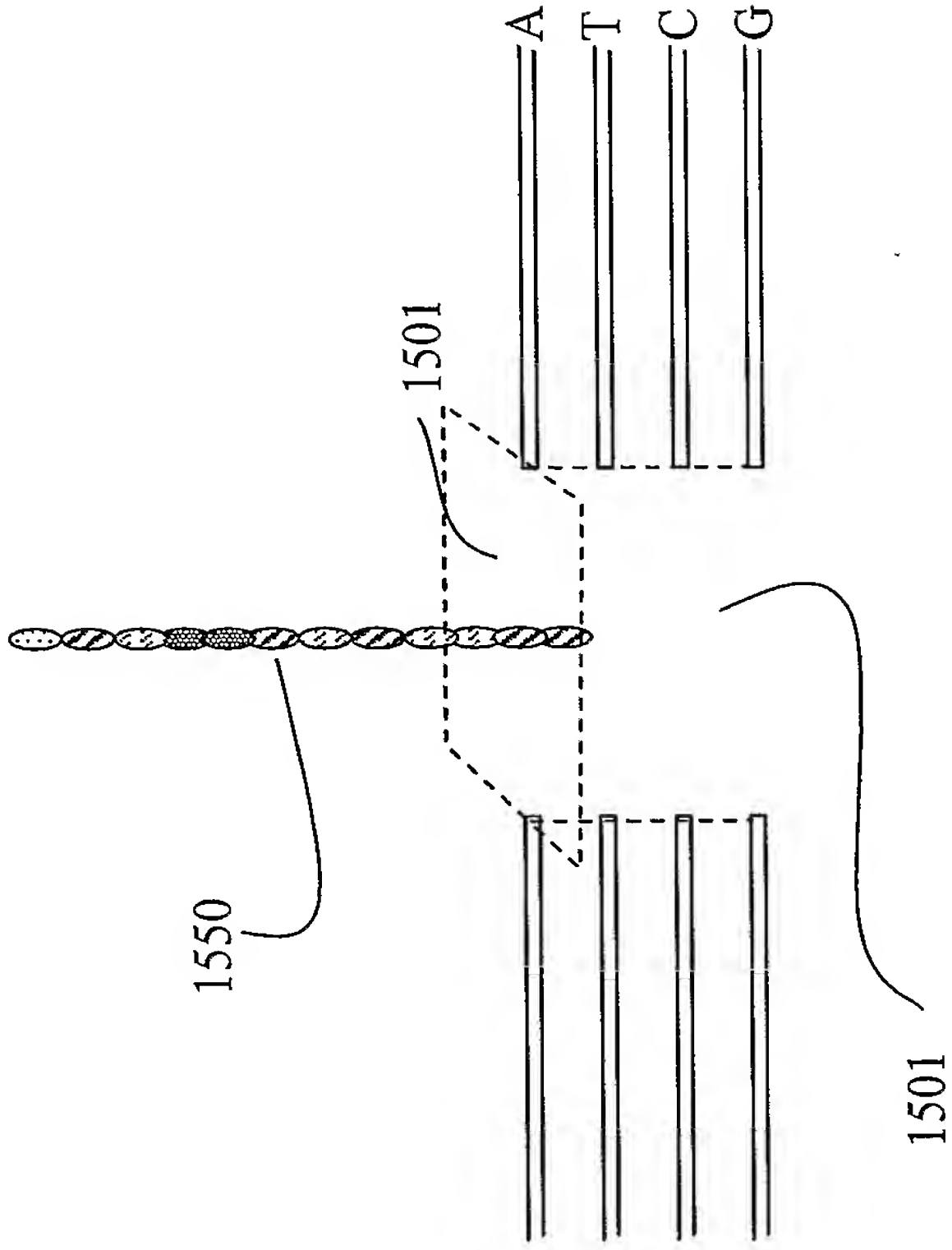


FIGURE 15B

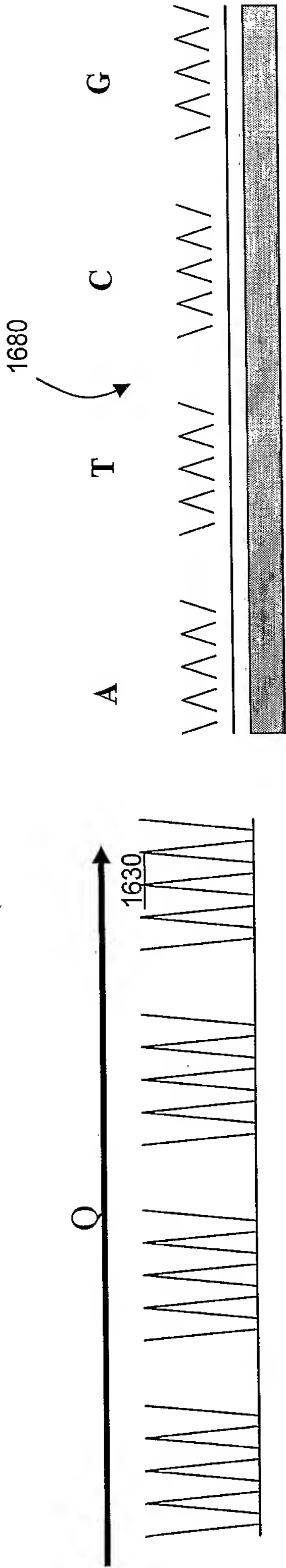


FIGURE 16A

FIGURE 16C

1677

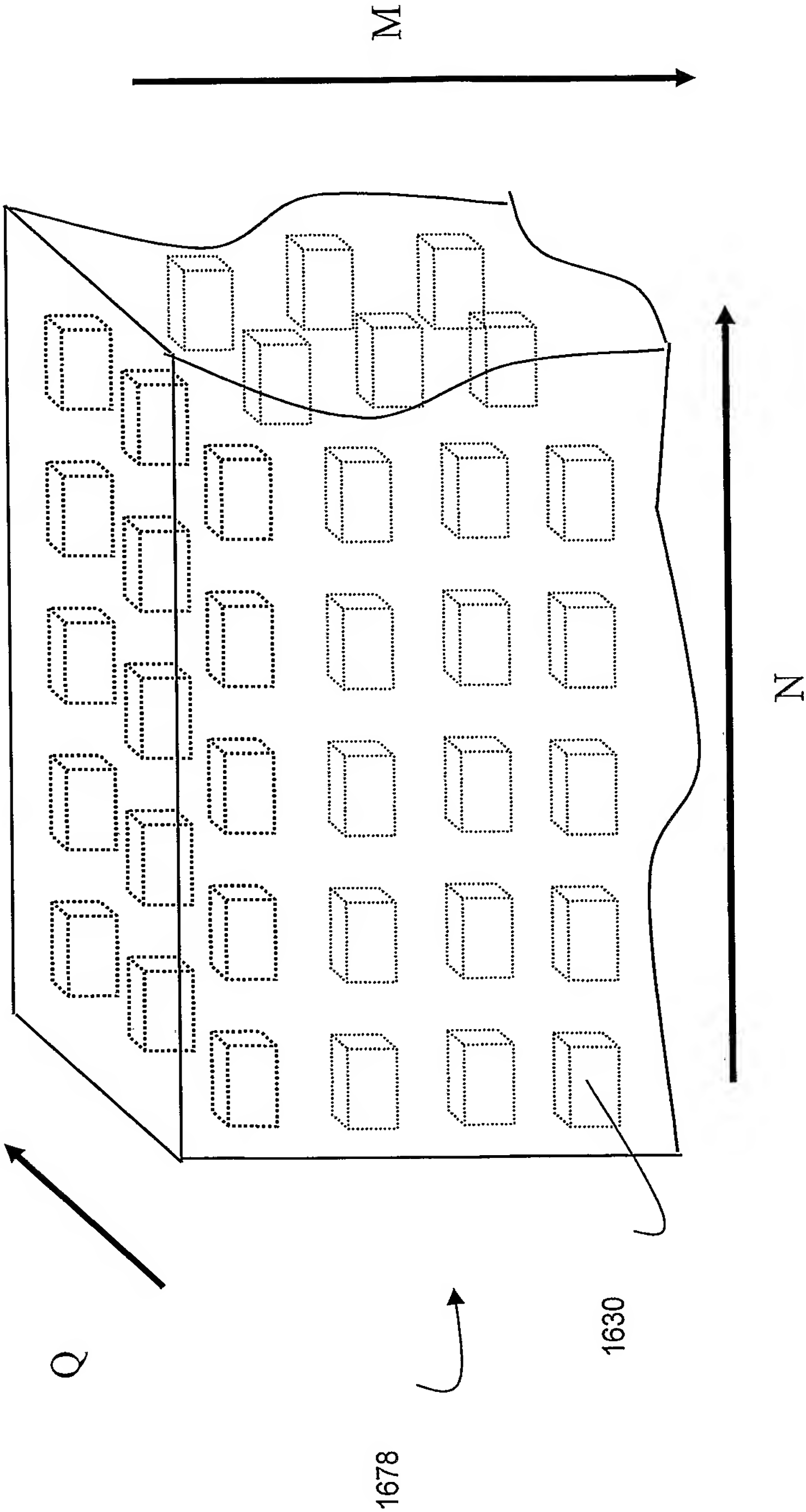


FIGURE 16B

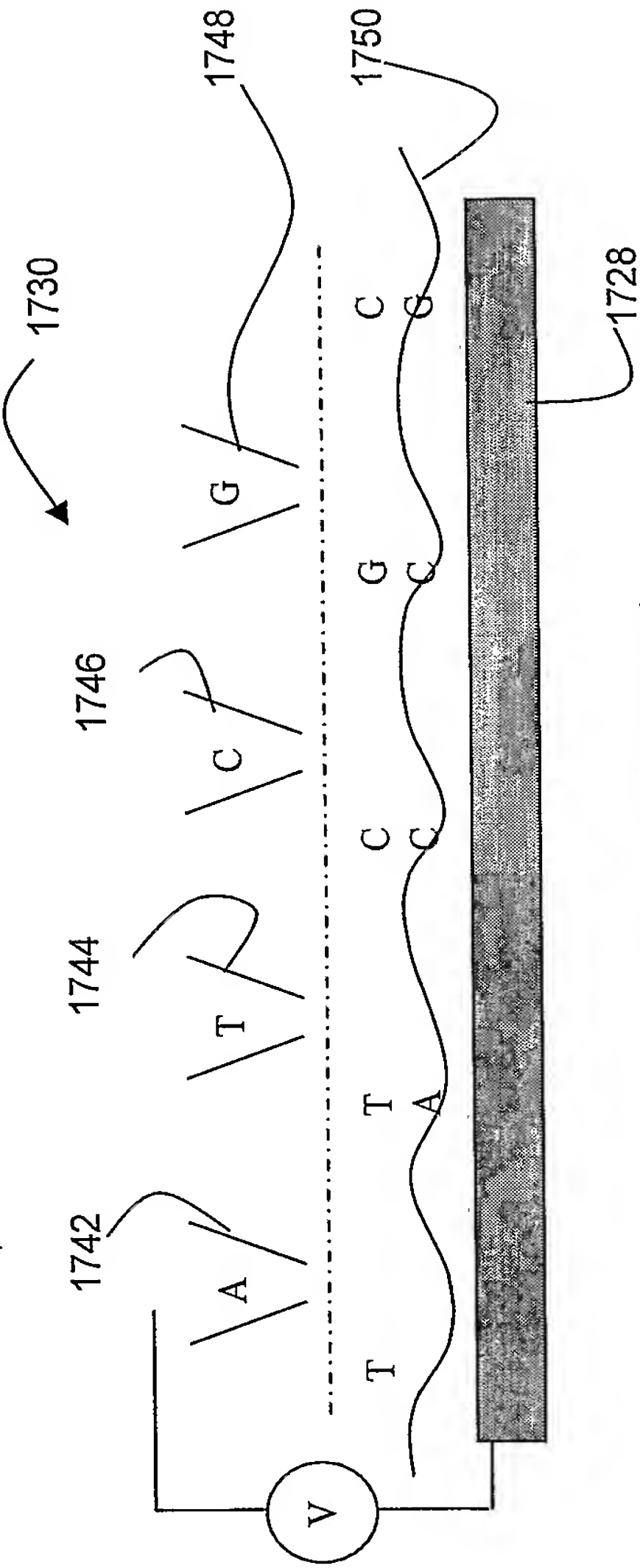


FIGURE 17A

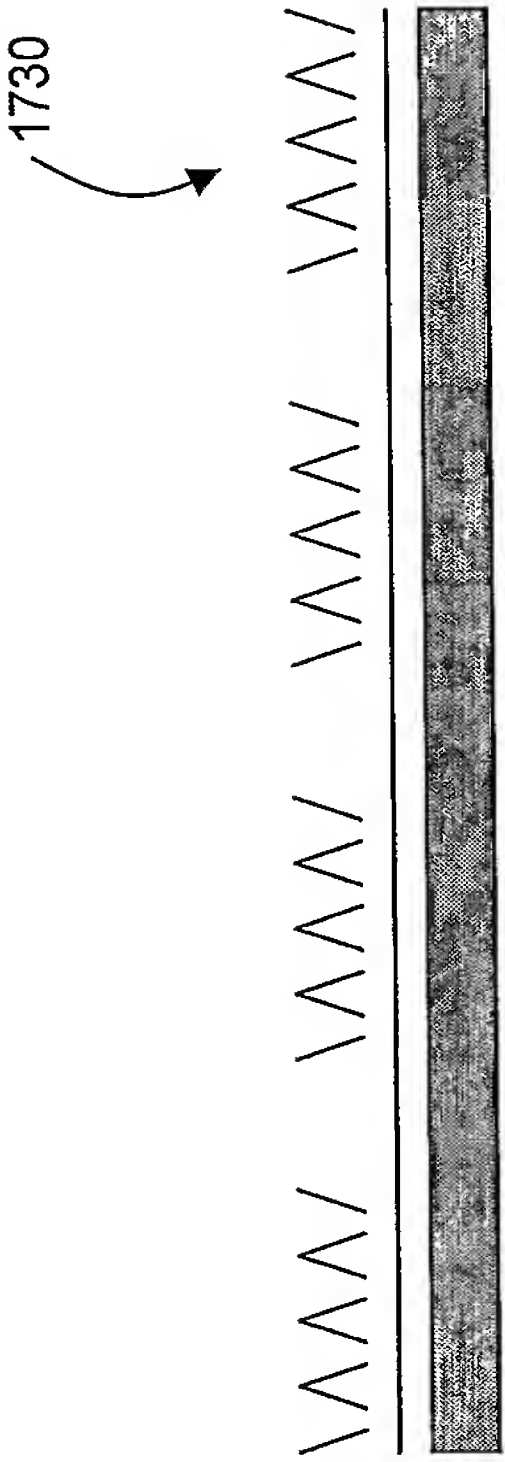


FIGURE 17B

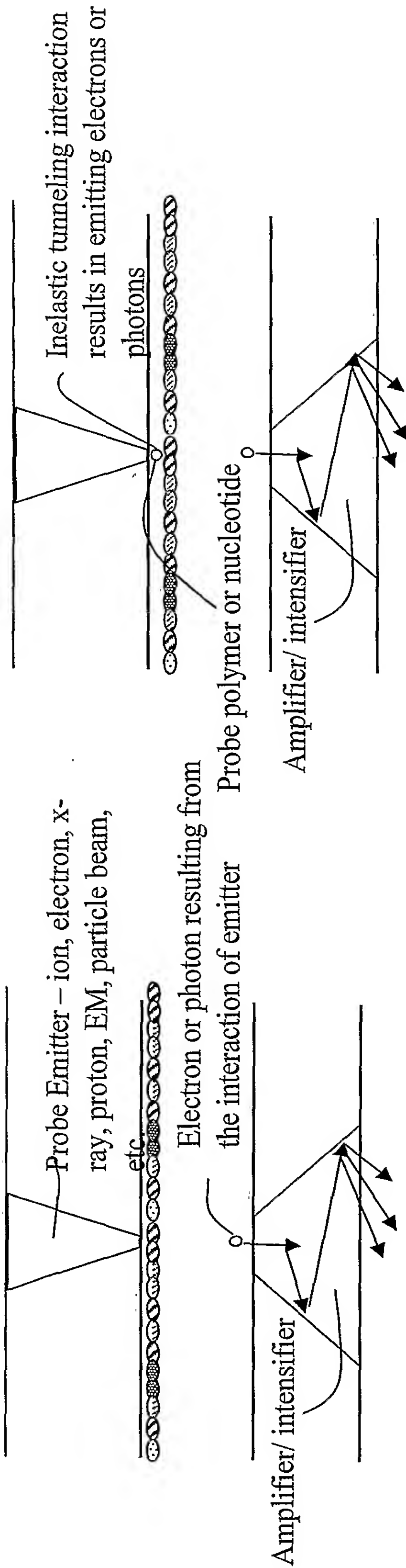
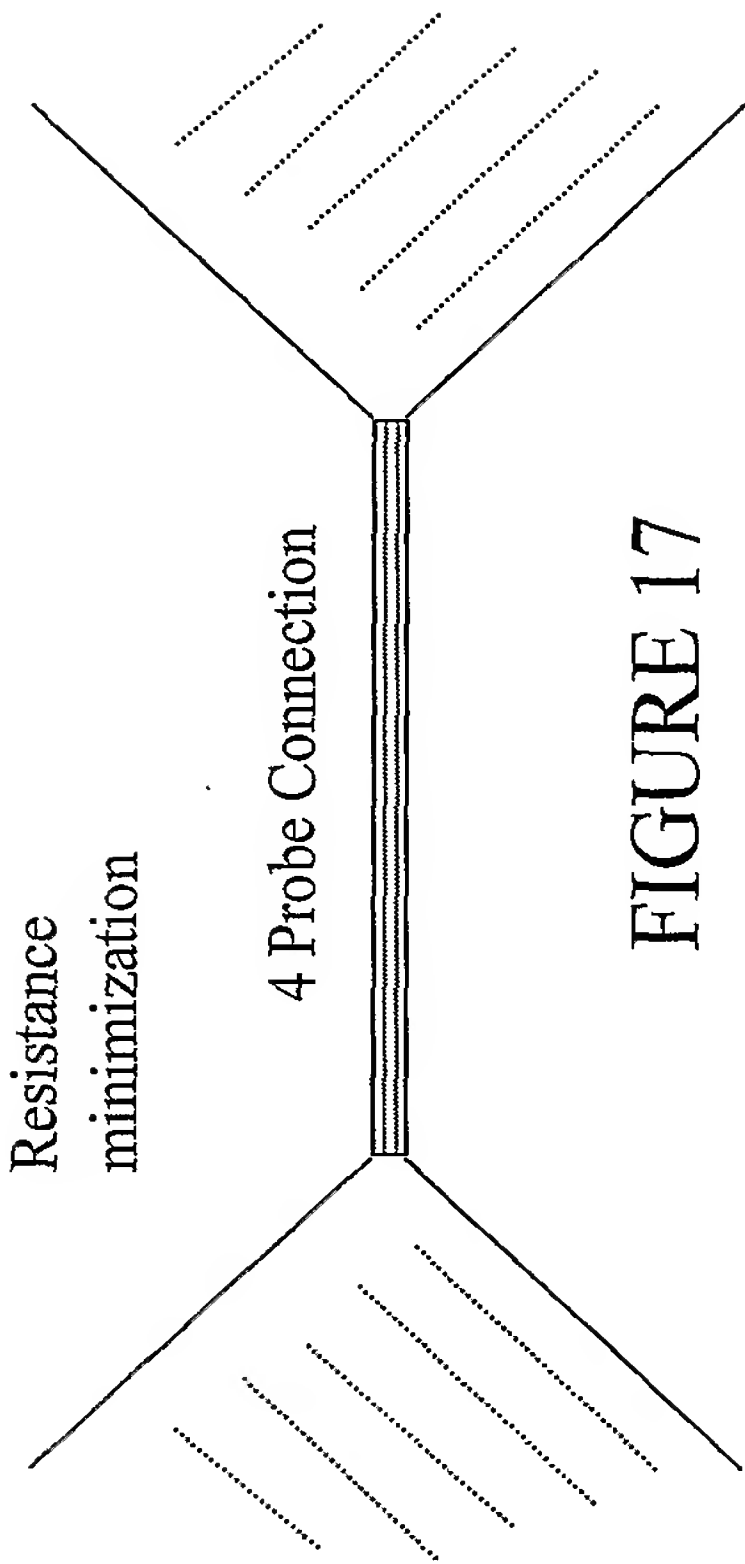
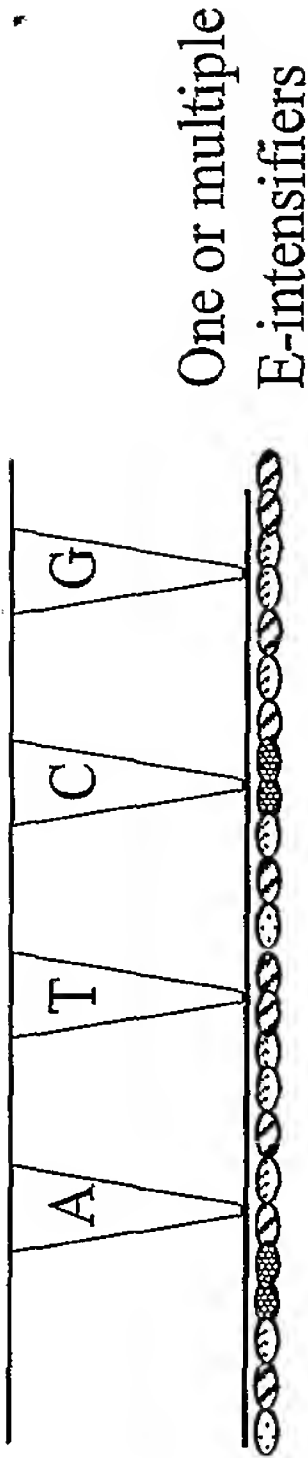


FIGURE 16A

FIGURE 16B

Emission



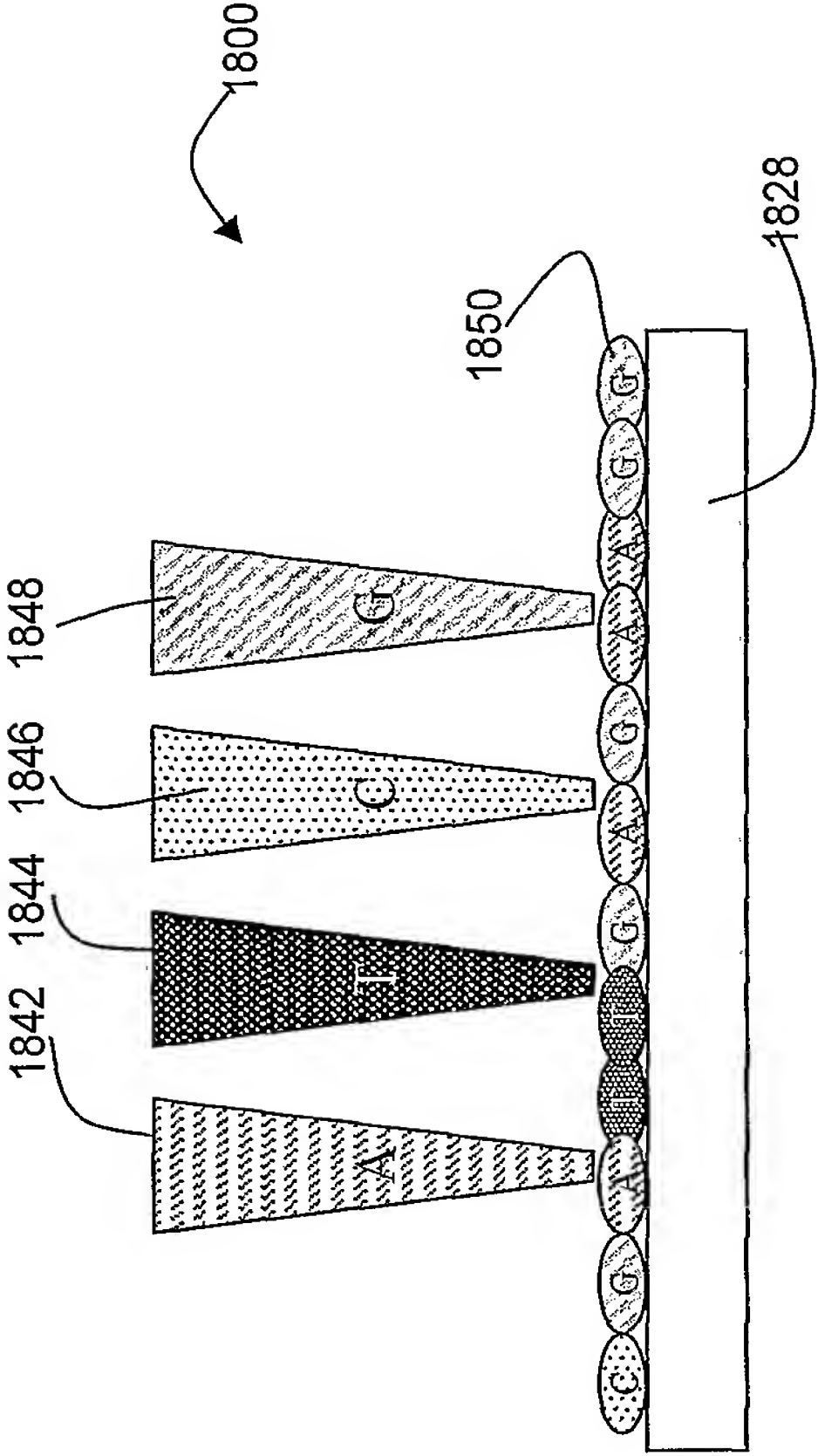


FIGURE 18A

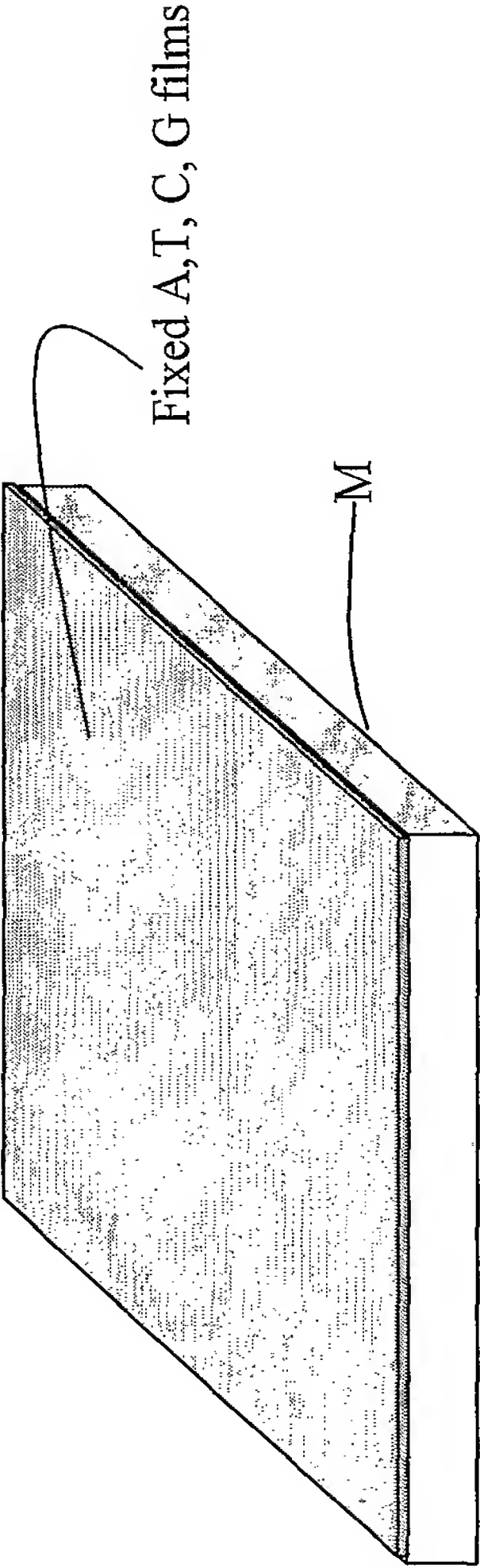


FIGURE 18B

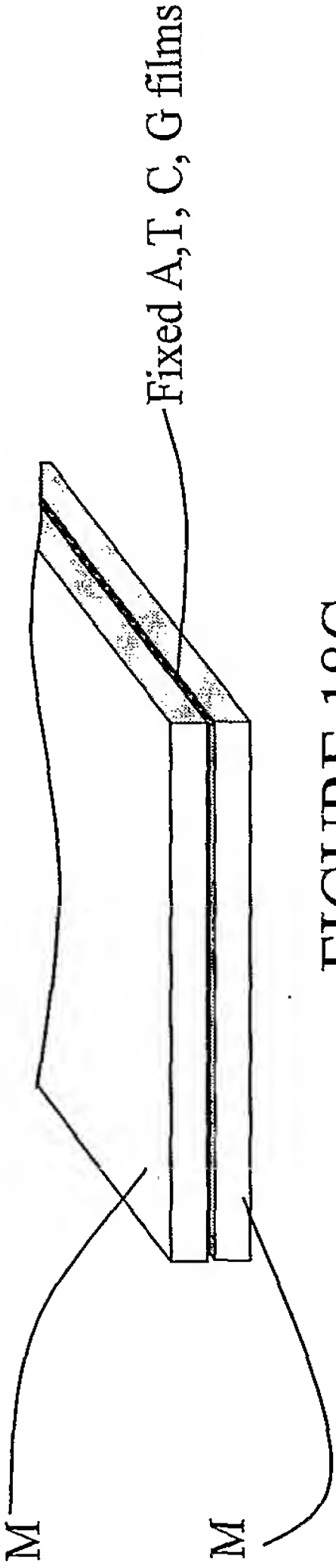


FIGURE 18C

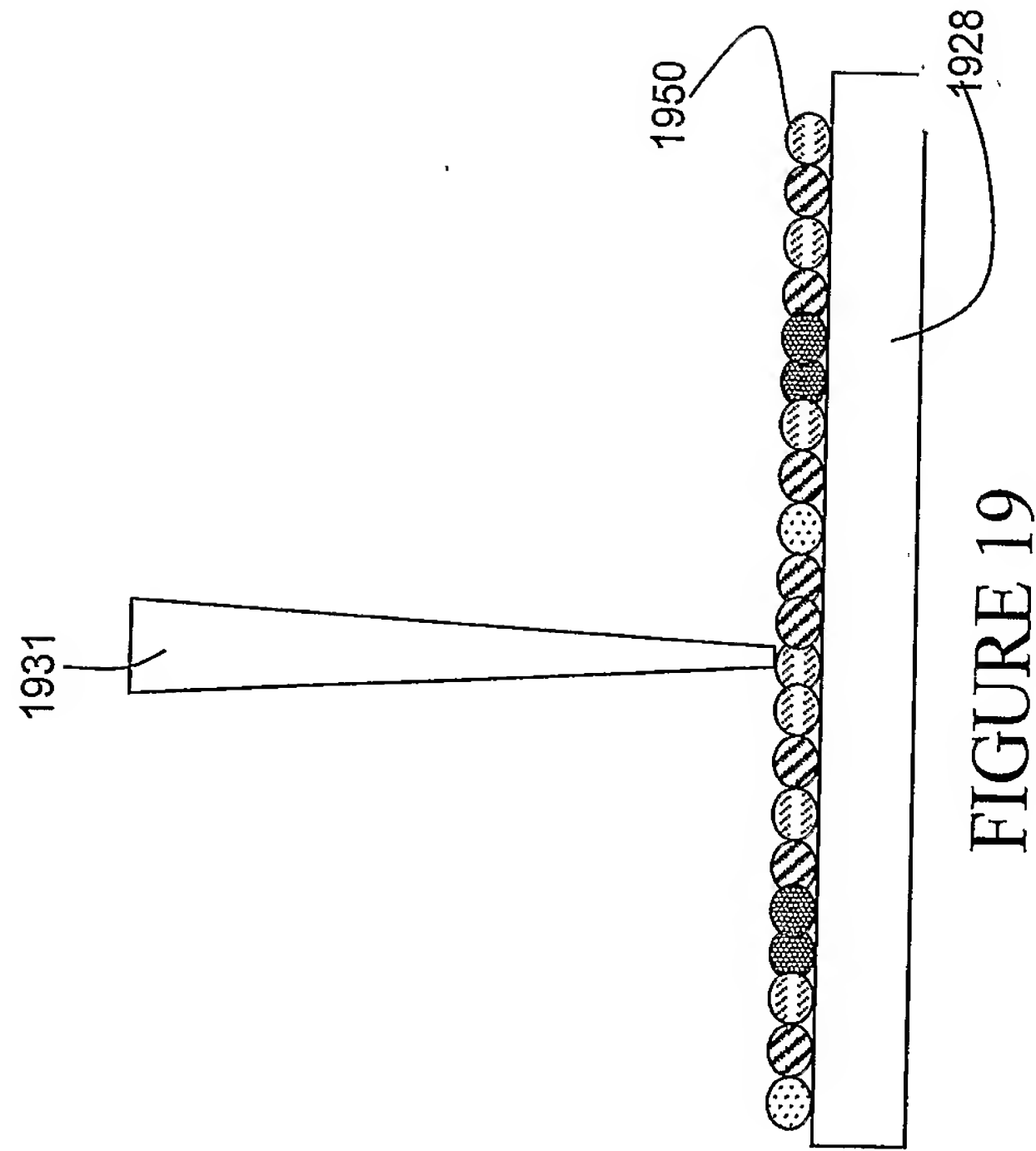


FIGURE 19

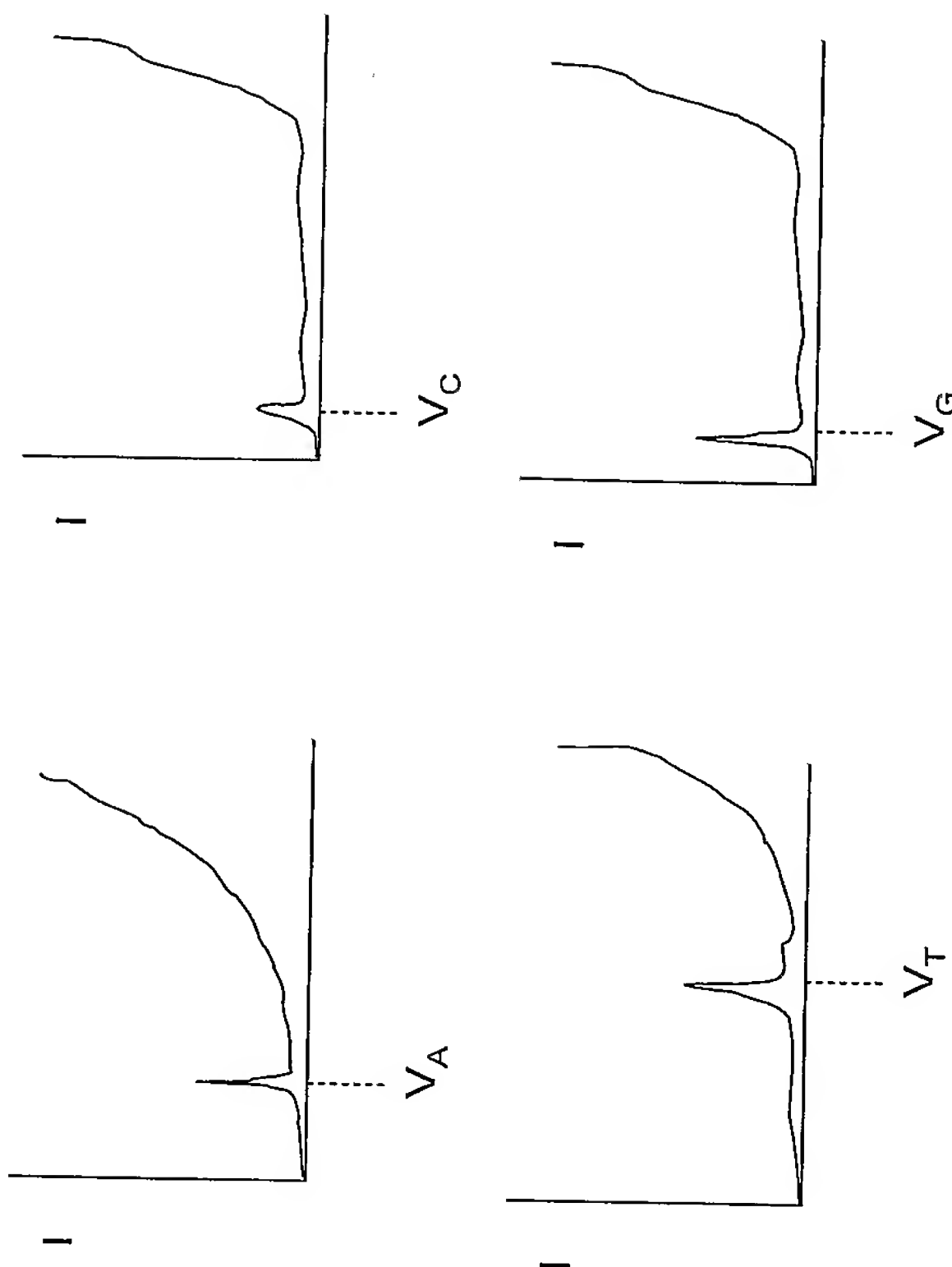


FIGURE 20

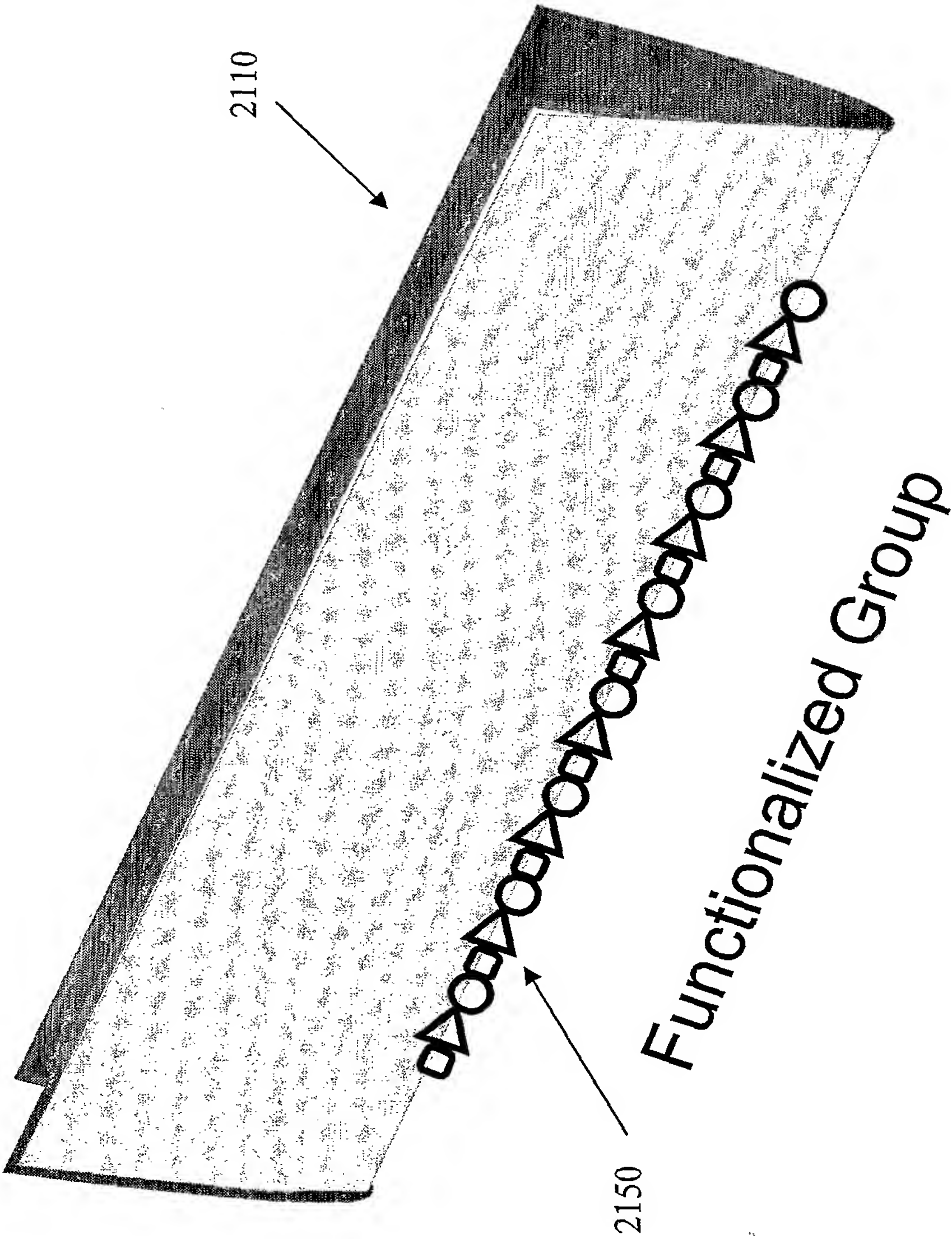


Figure 21

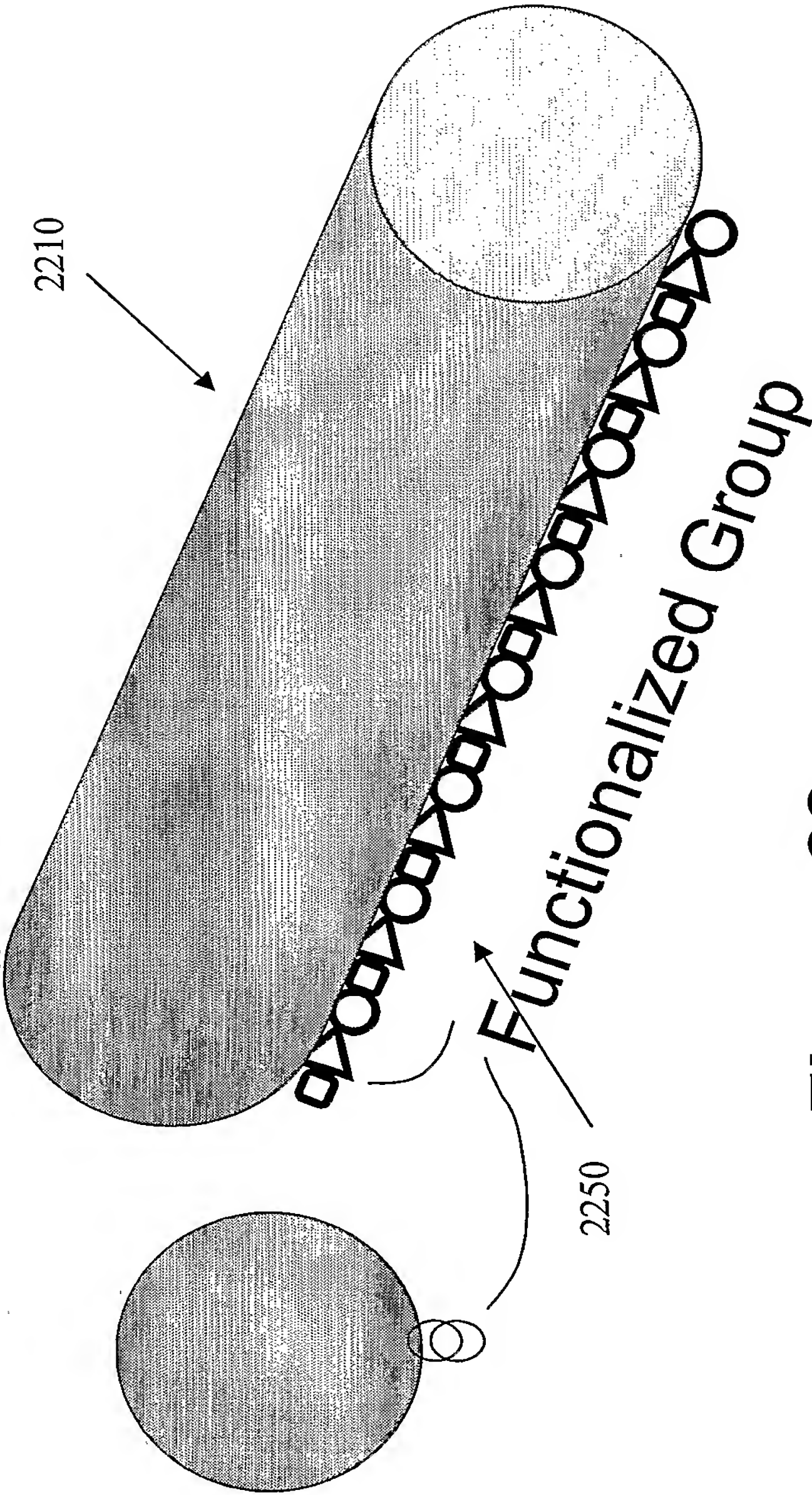


Figure 22

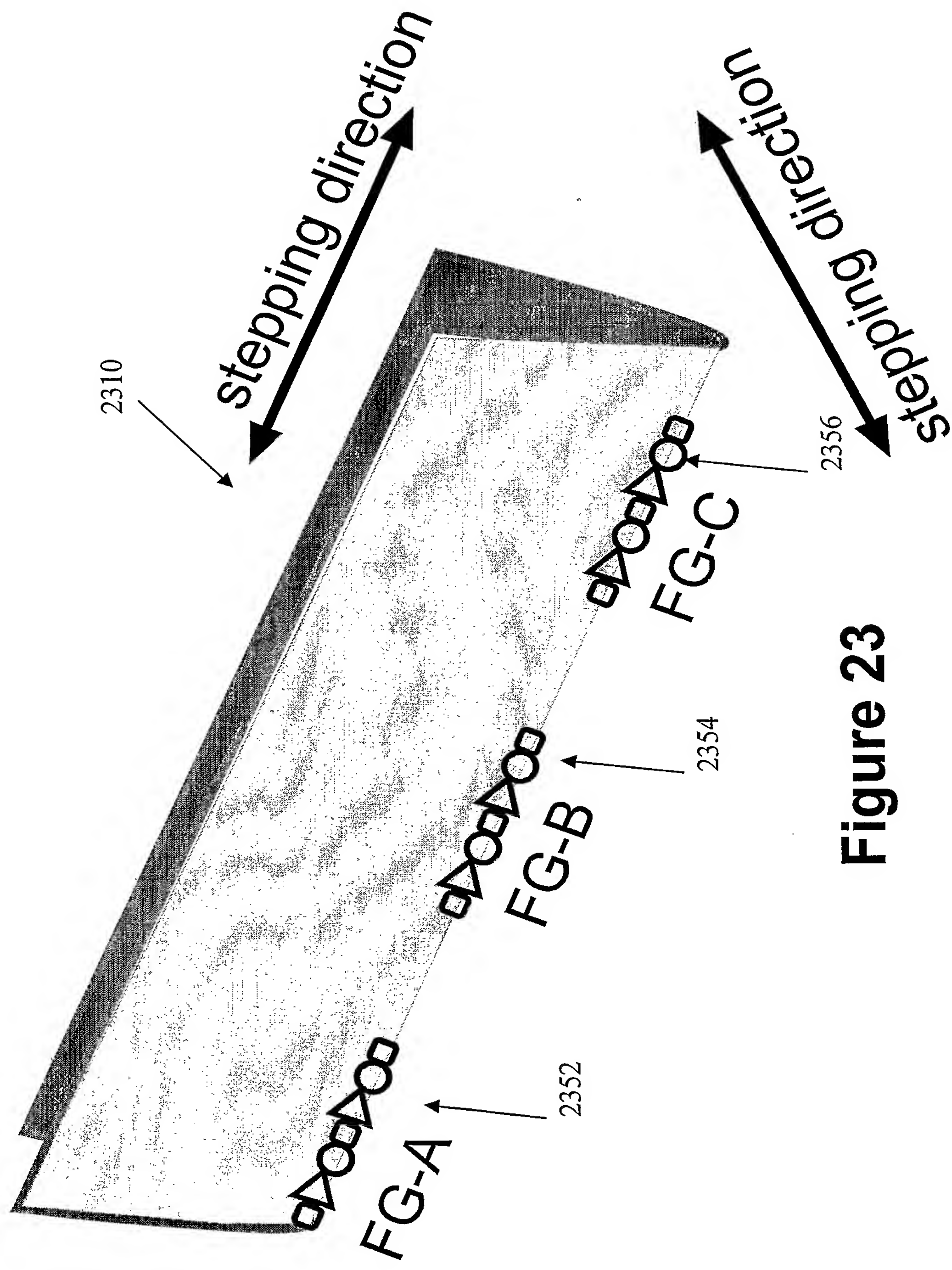
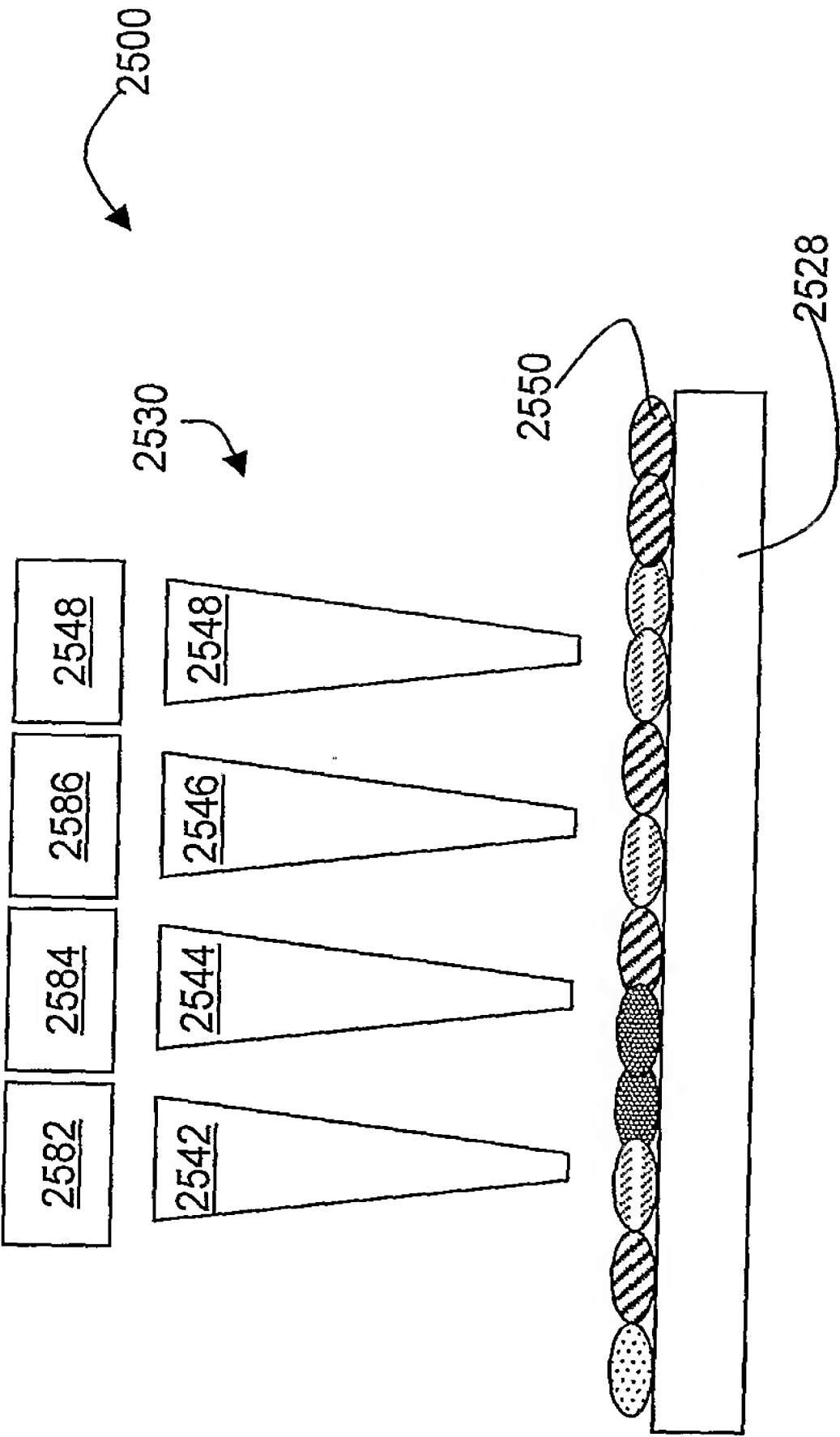
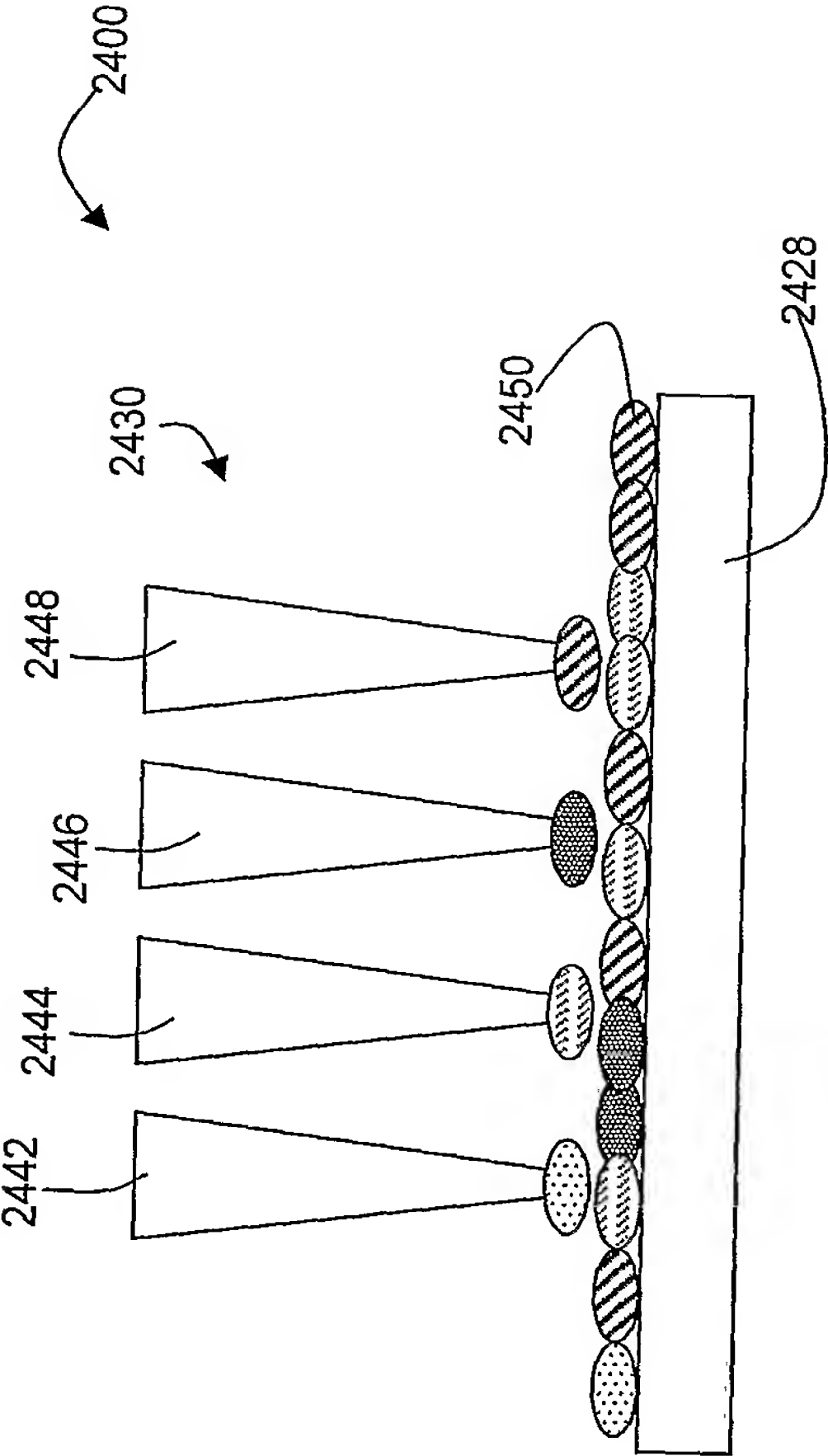


Figure 23



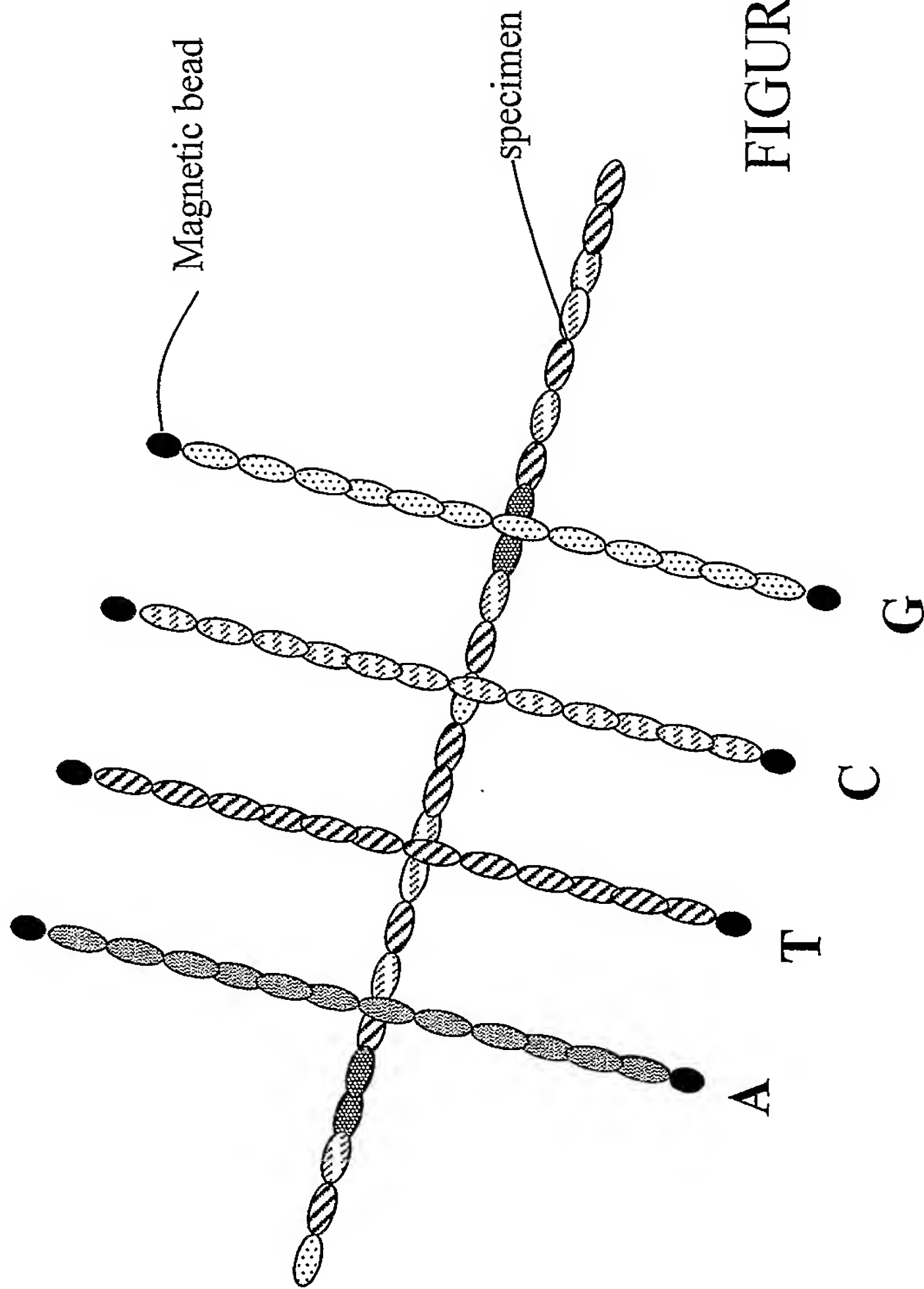


FIGURE 24B

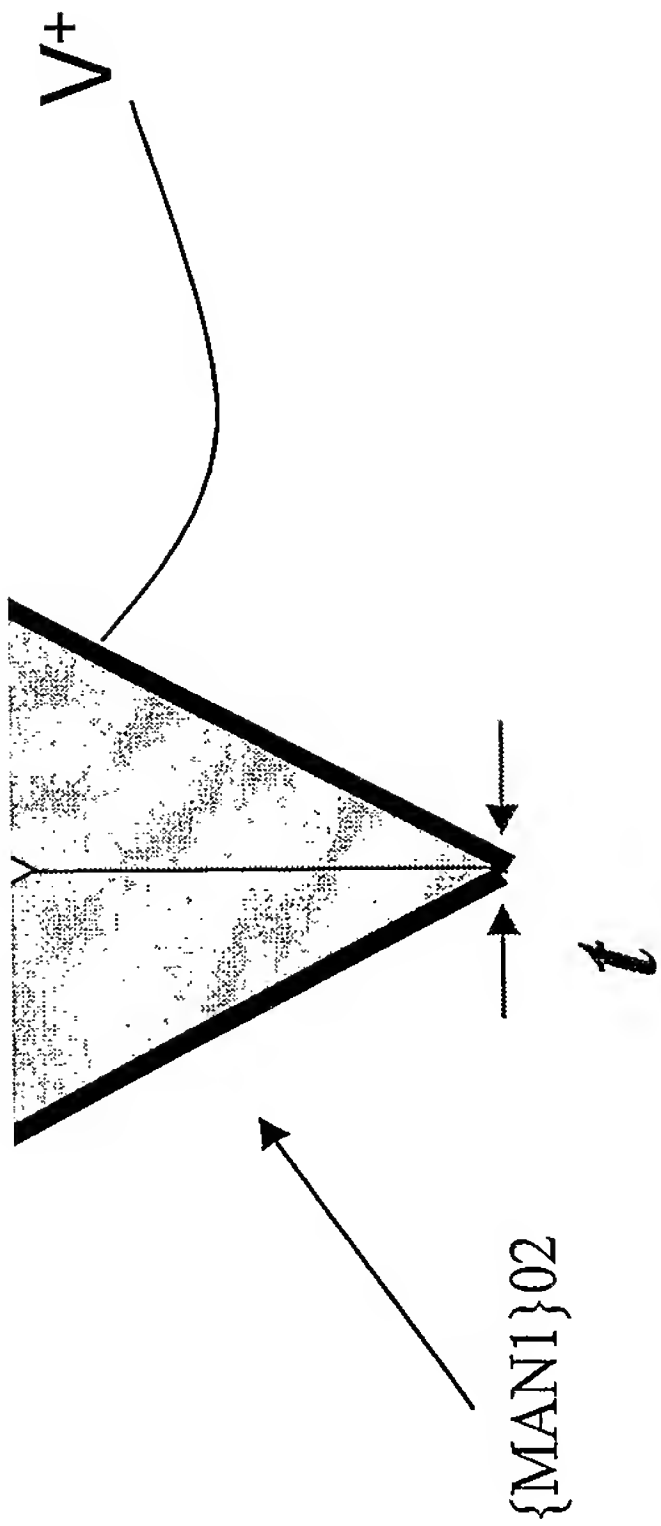


Figure {MAN1}

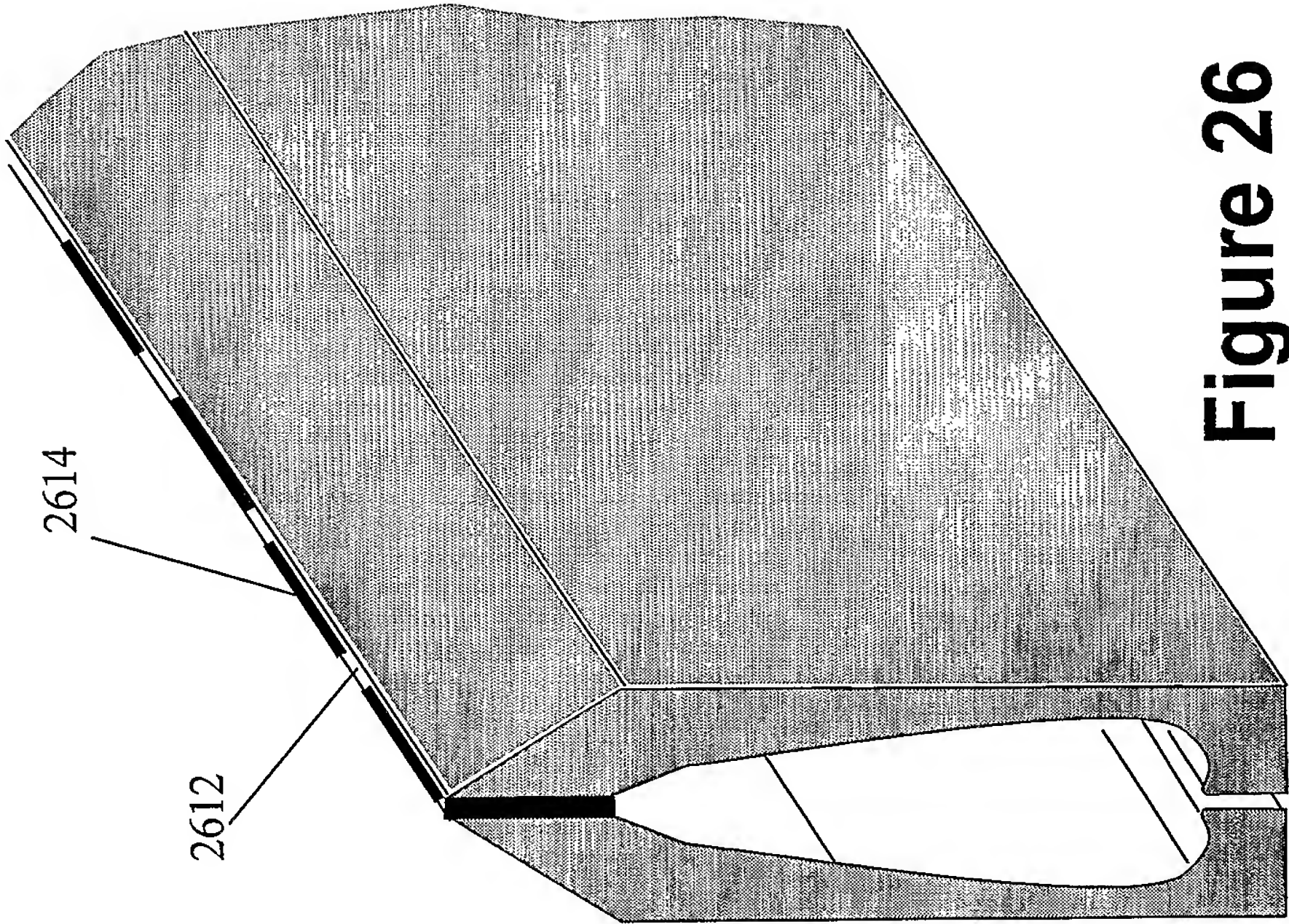


Figure 26

Figure 27A

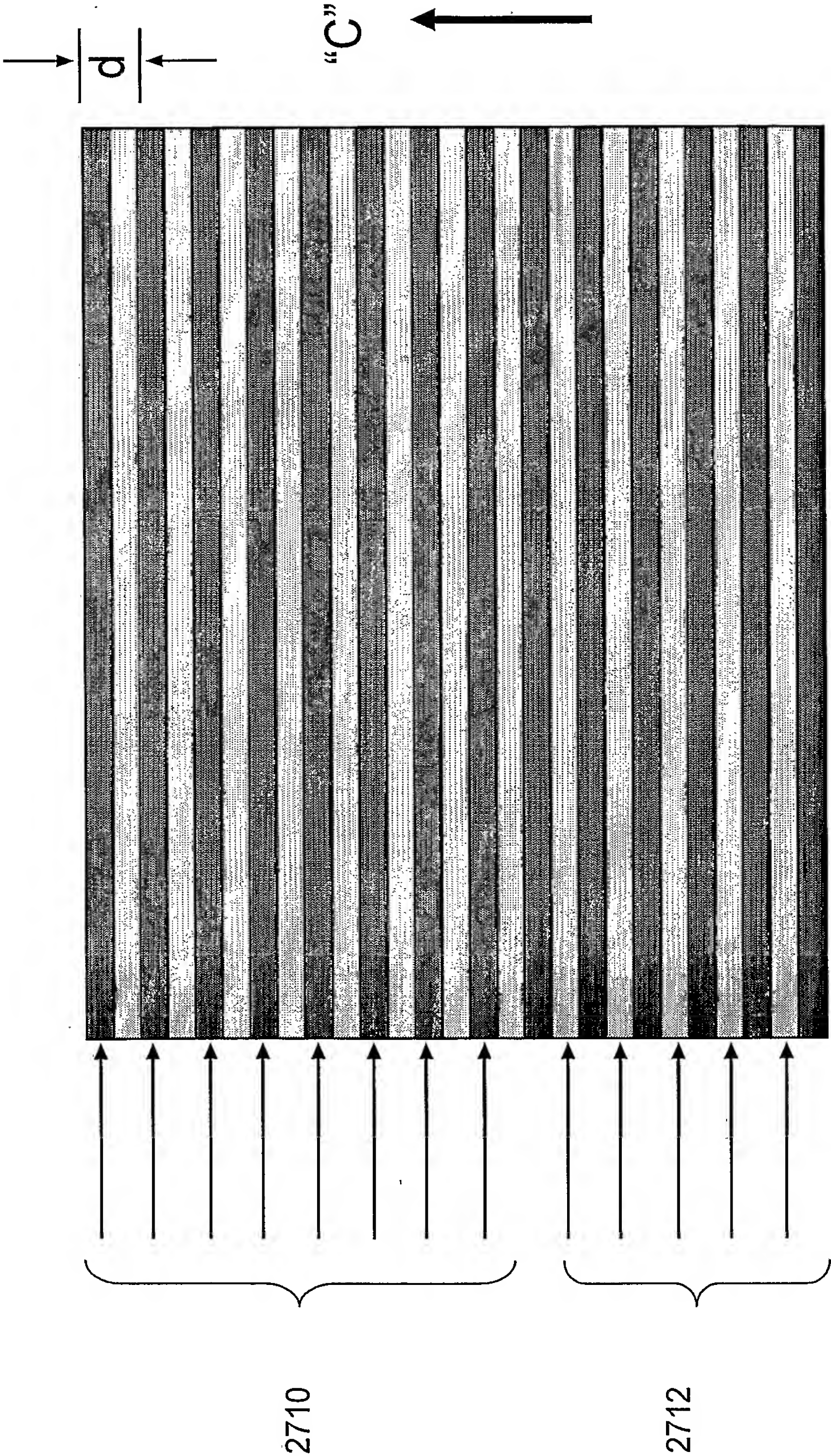


Figure 27B

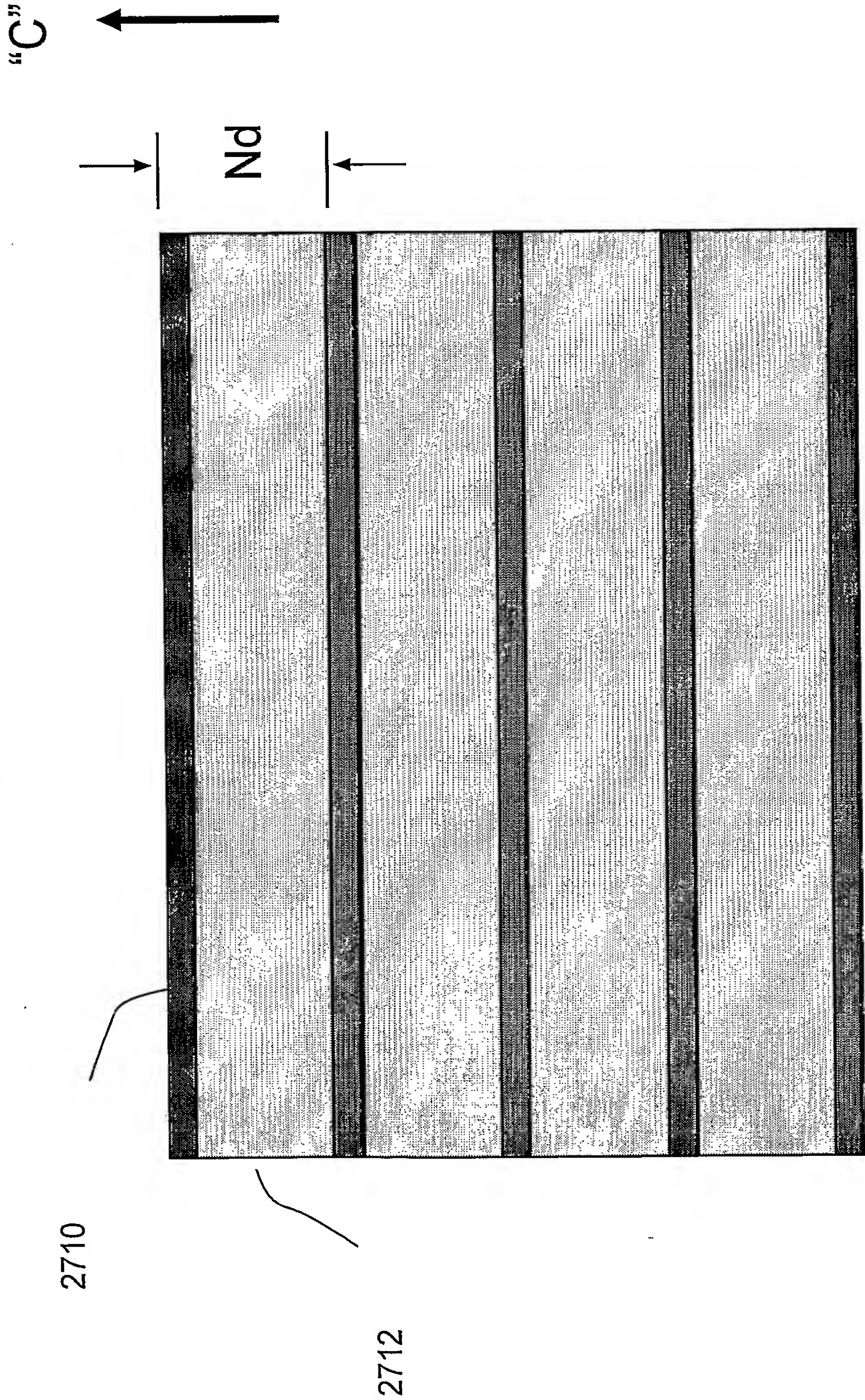


Figure 28A

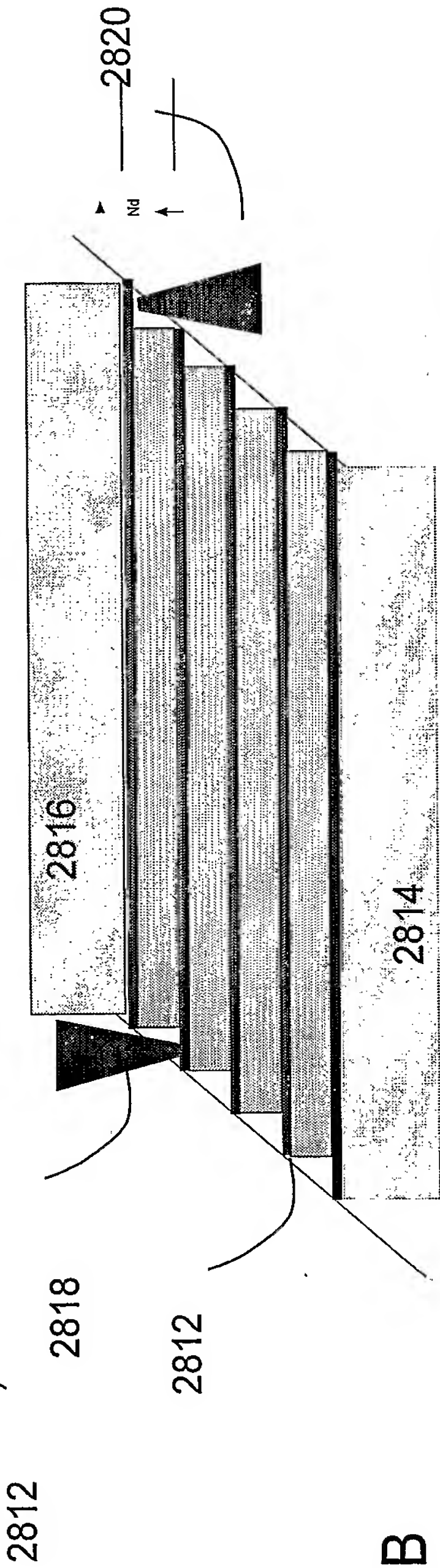
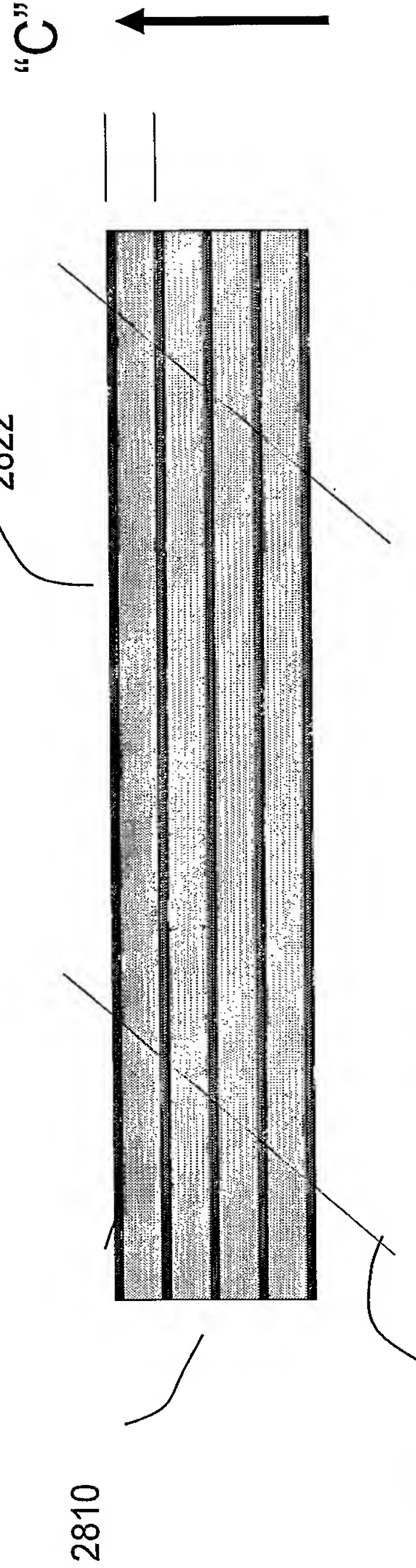


Figure 28B

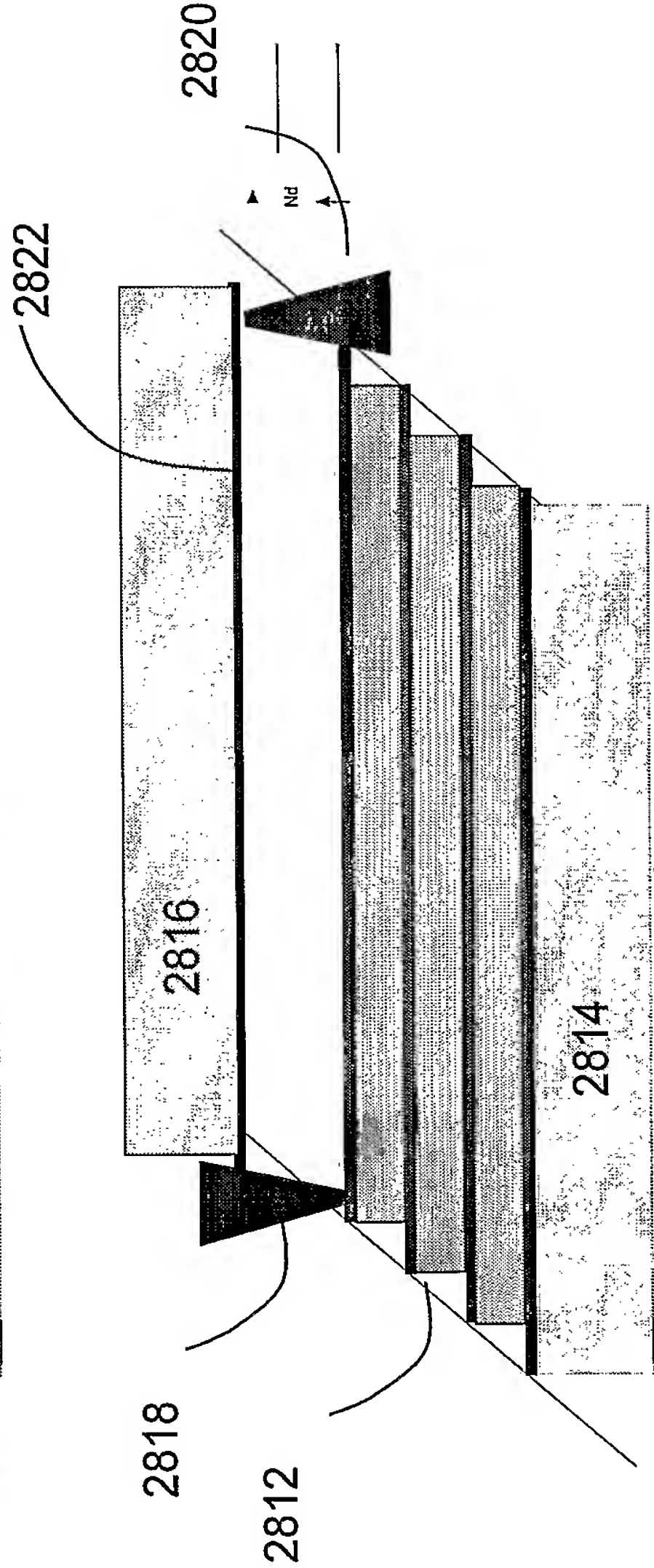


Figure 28C

Figure 28D

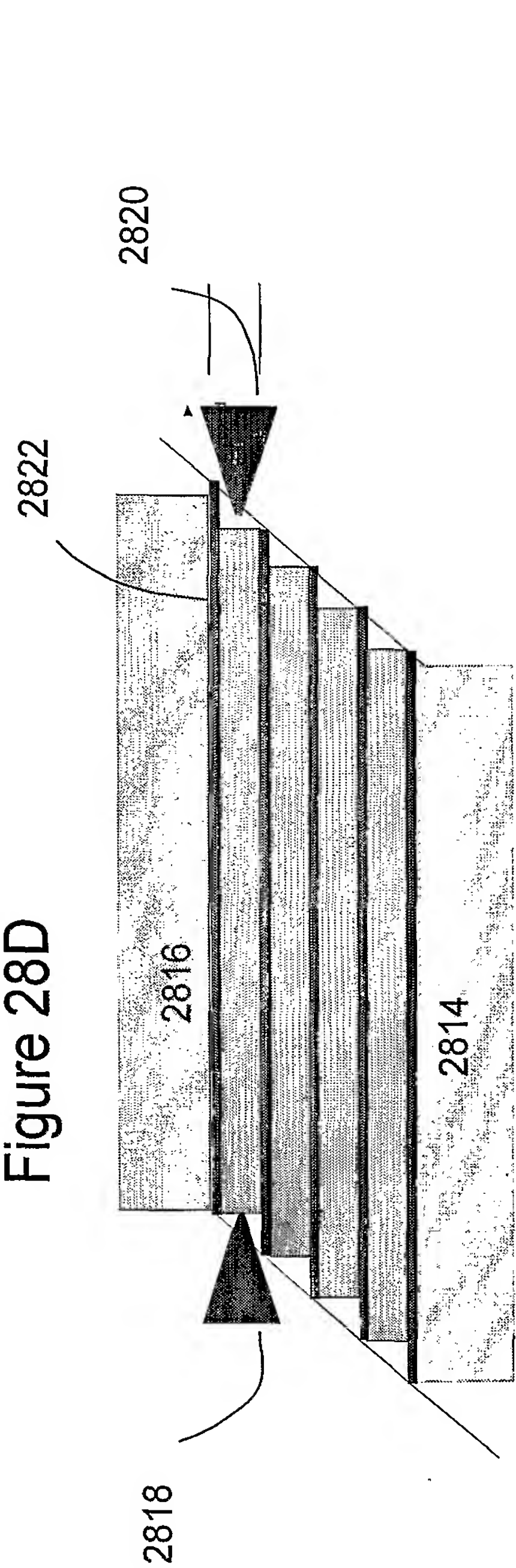


Figure 28E

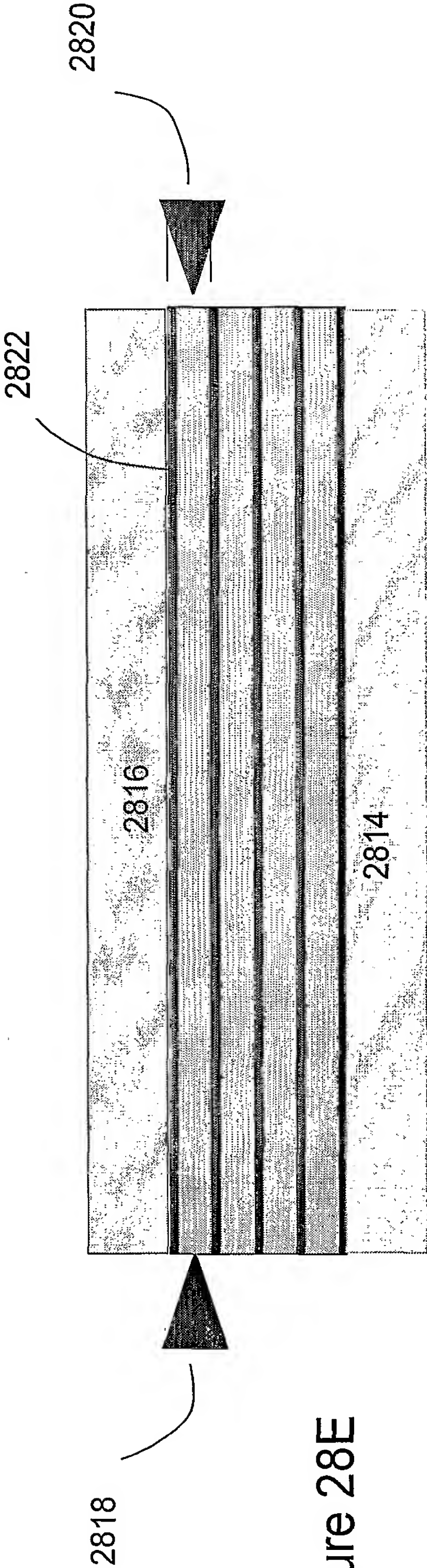
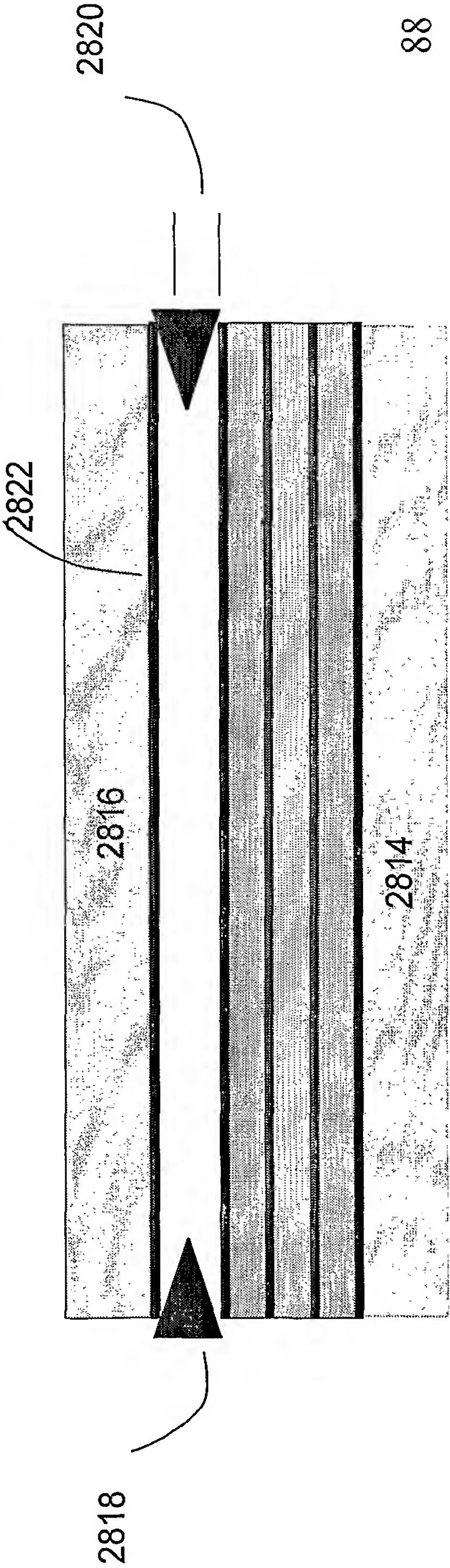


Figure 28F



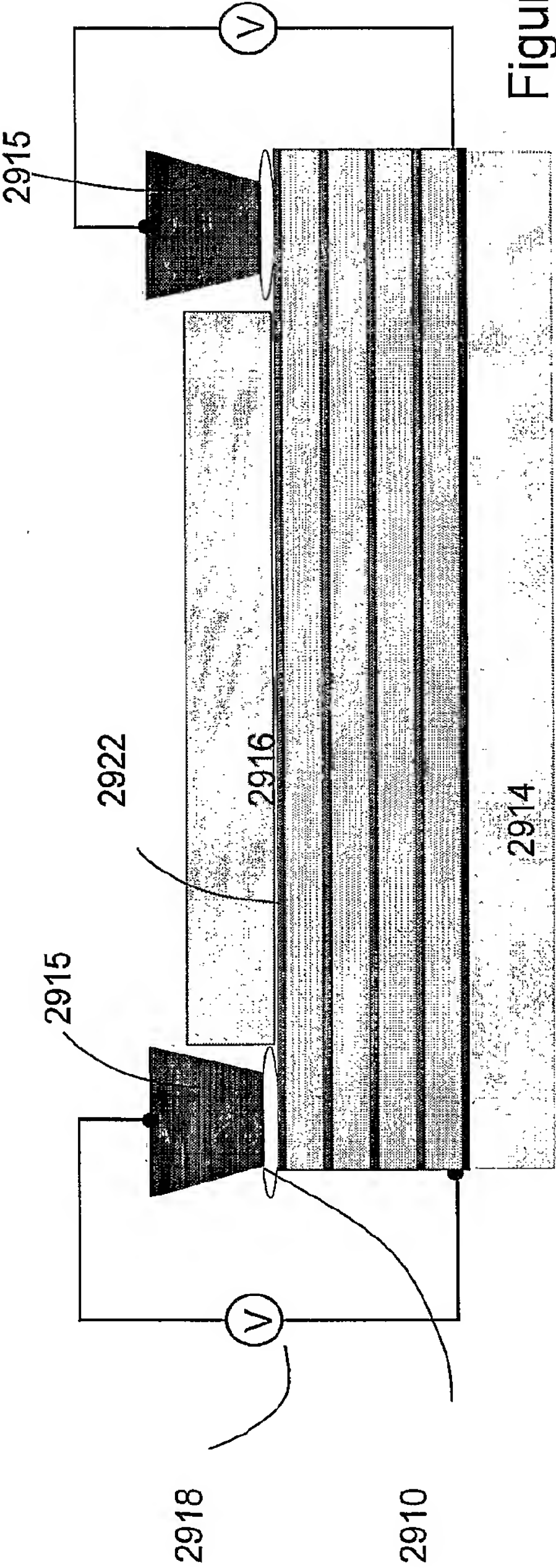


Figure 29A

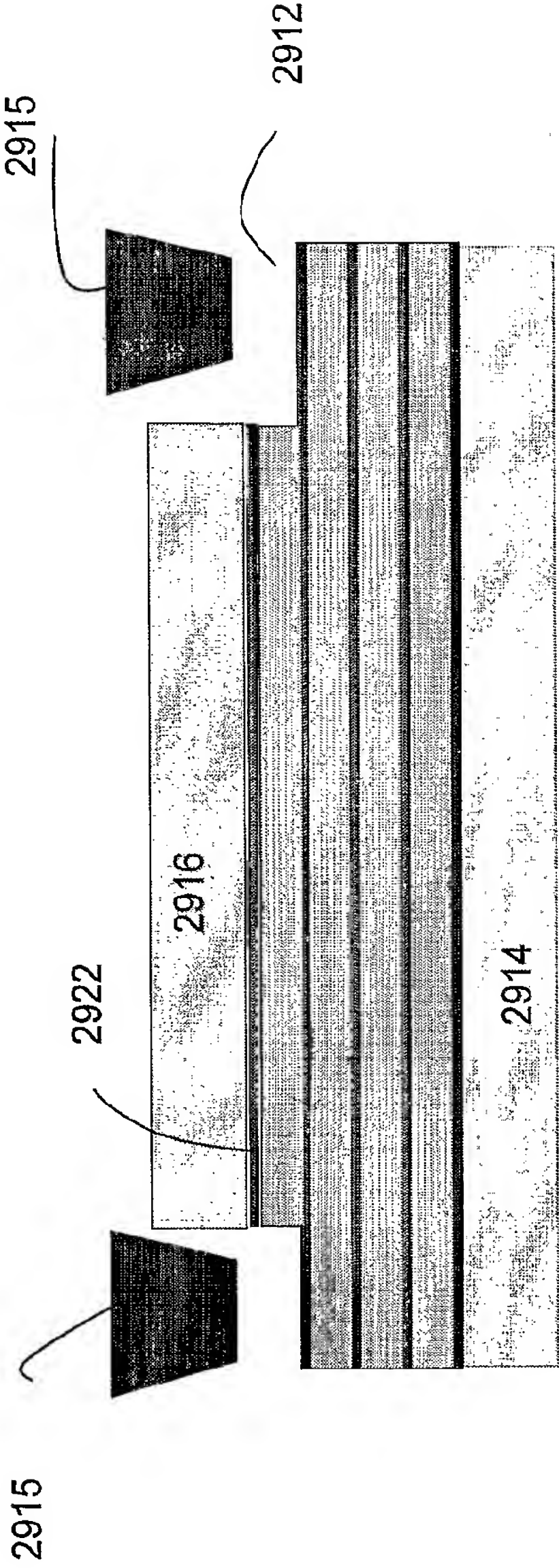


Figure 29B

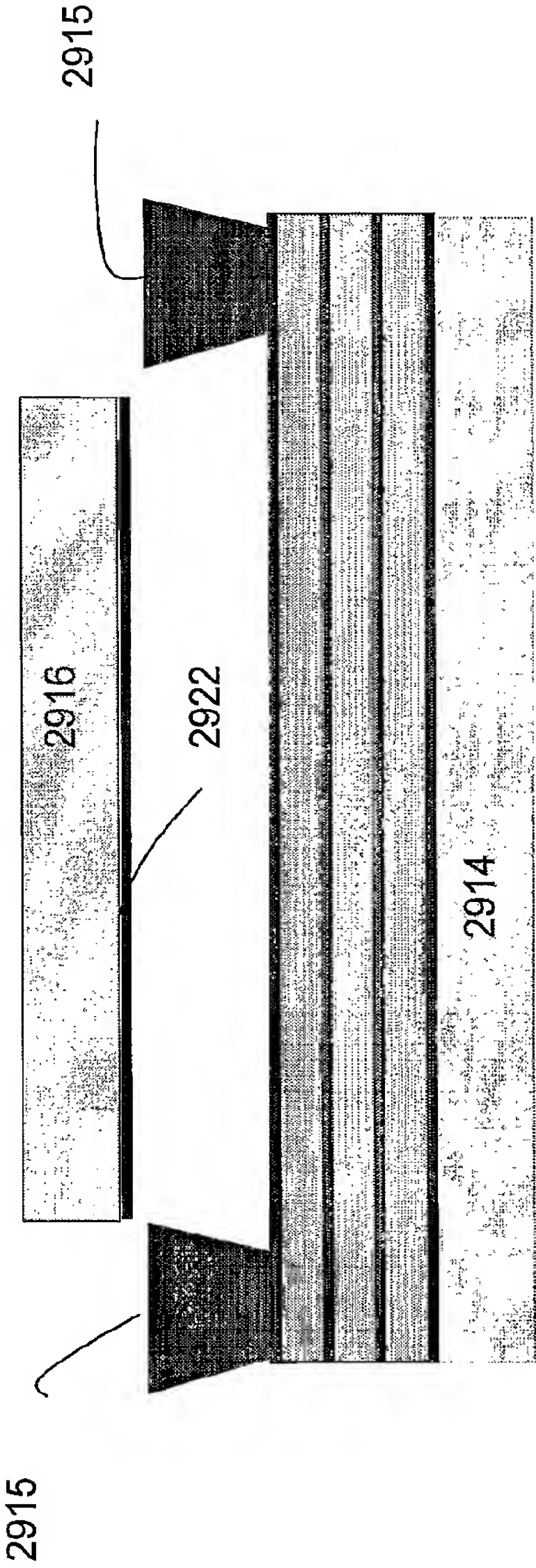


Figure 29C

Figure 30A

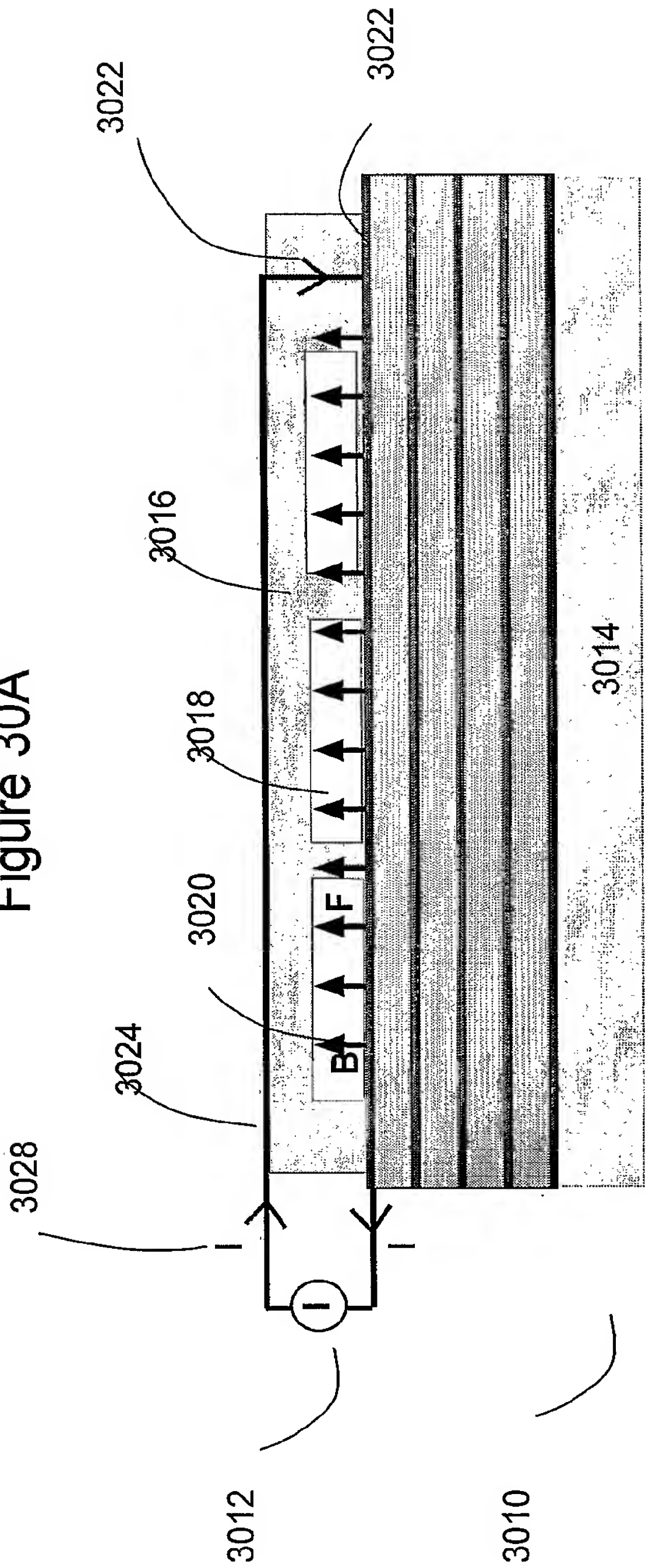


Figure 30B

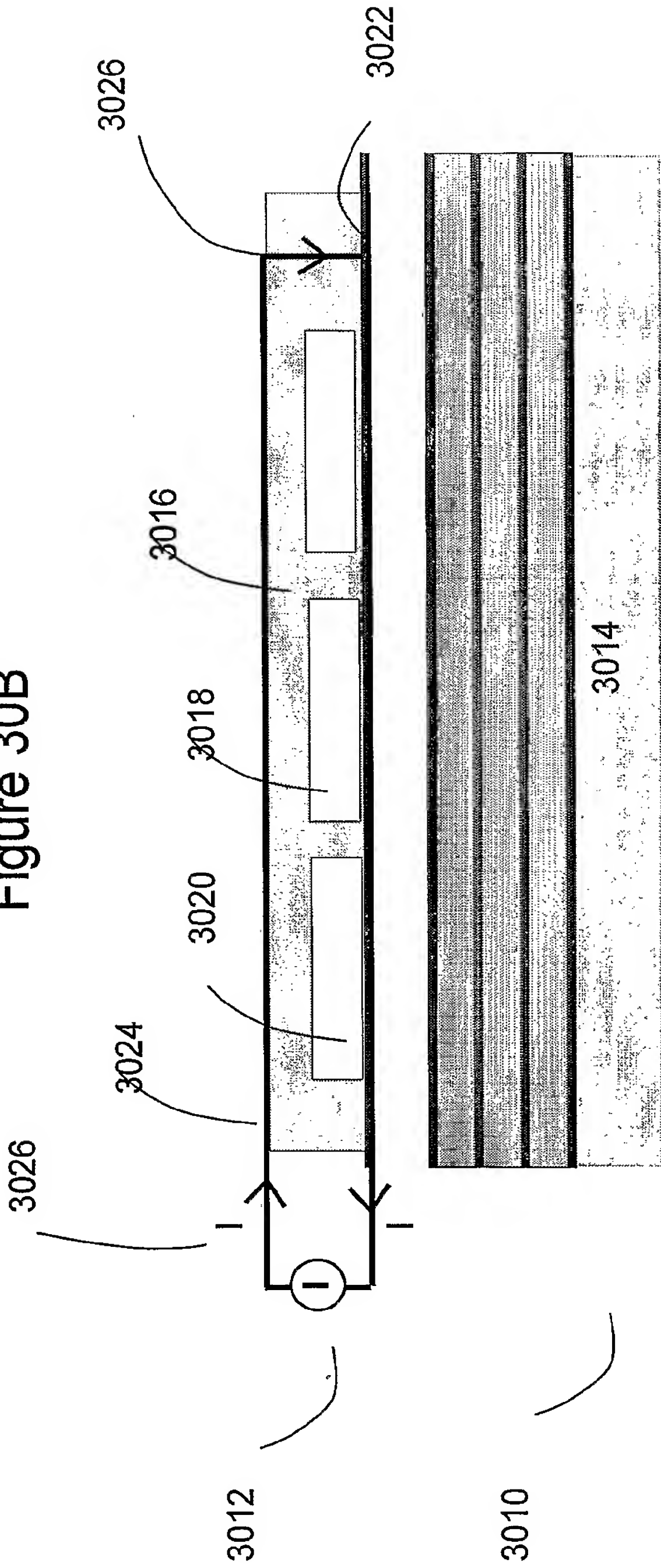


Figure 31A

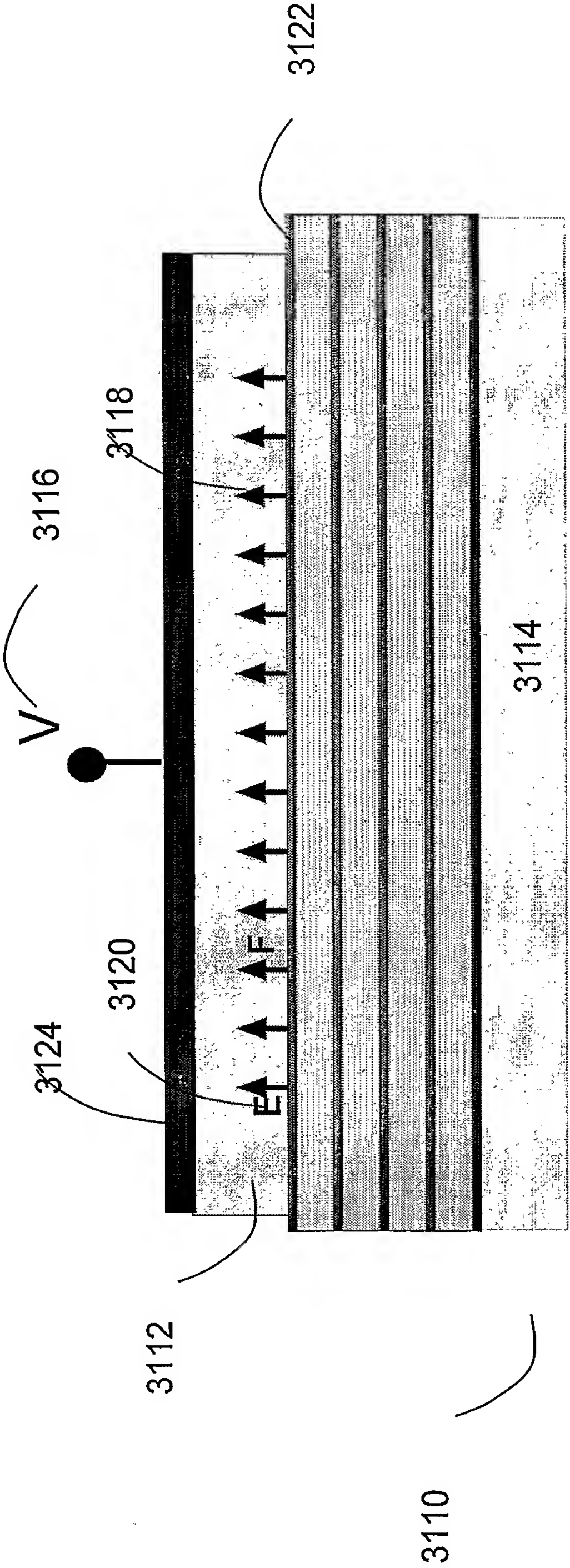
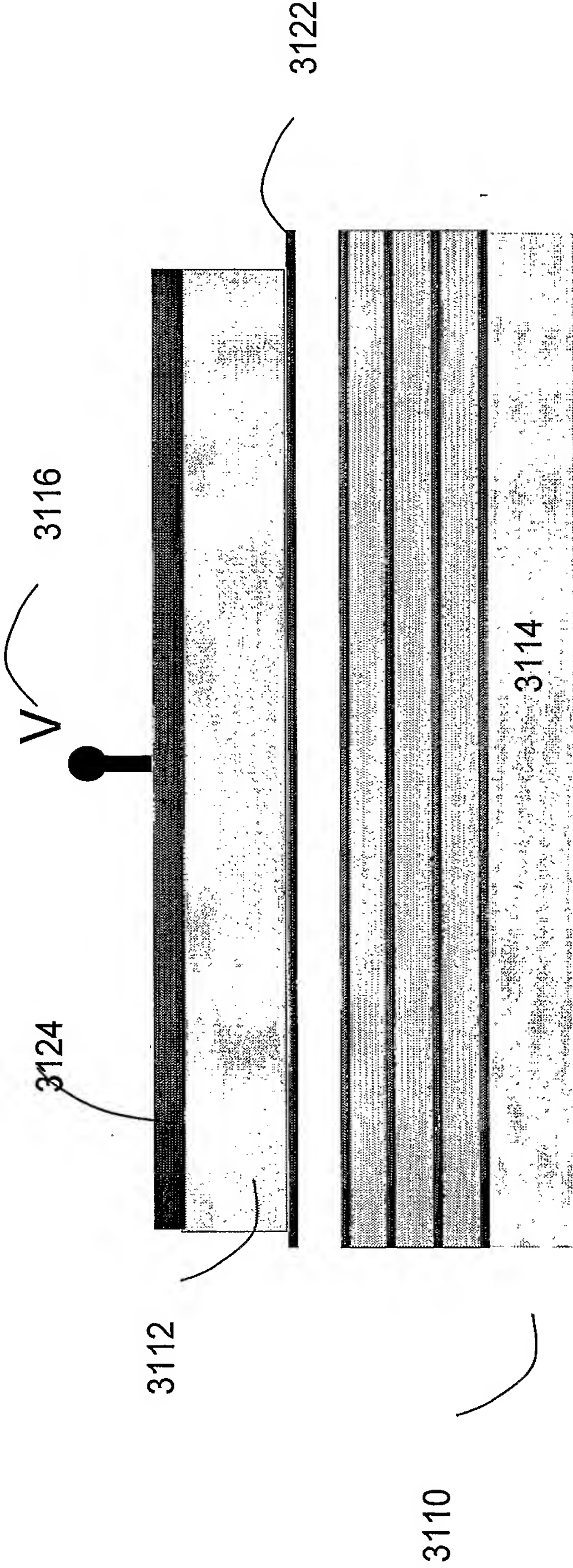


Figure 31B



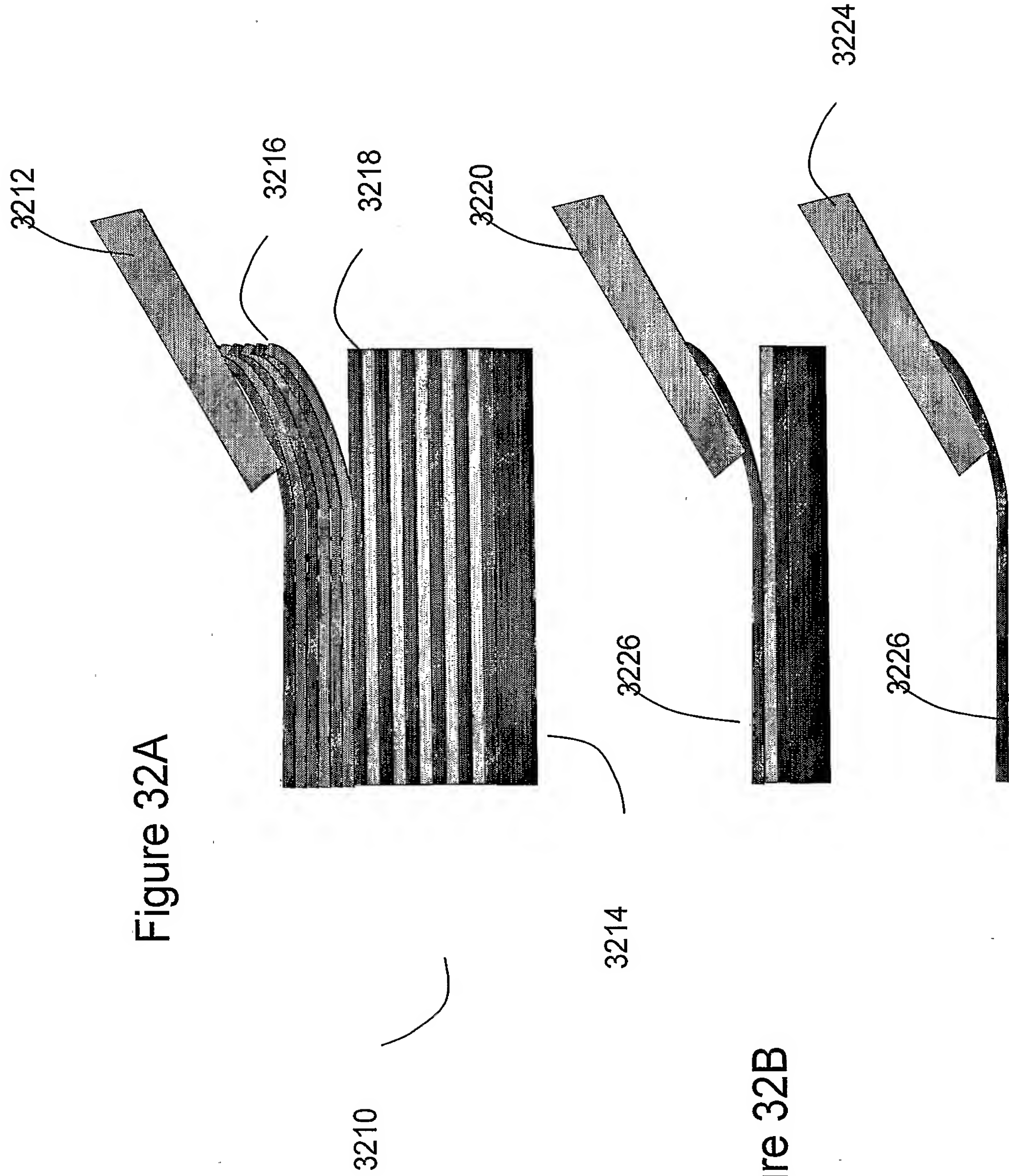


Figure 32B

Figure 32C



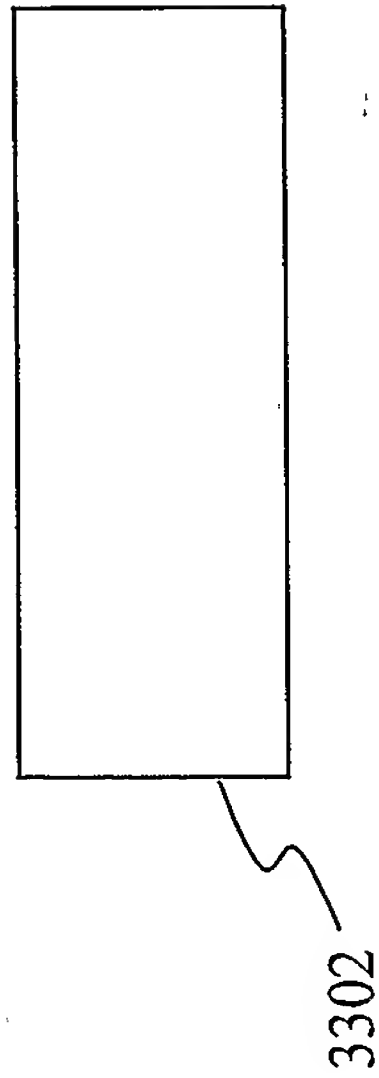


Figure 33B

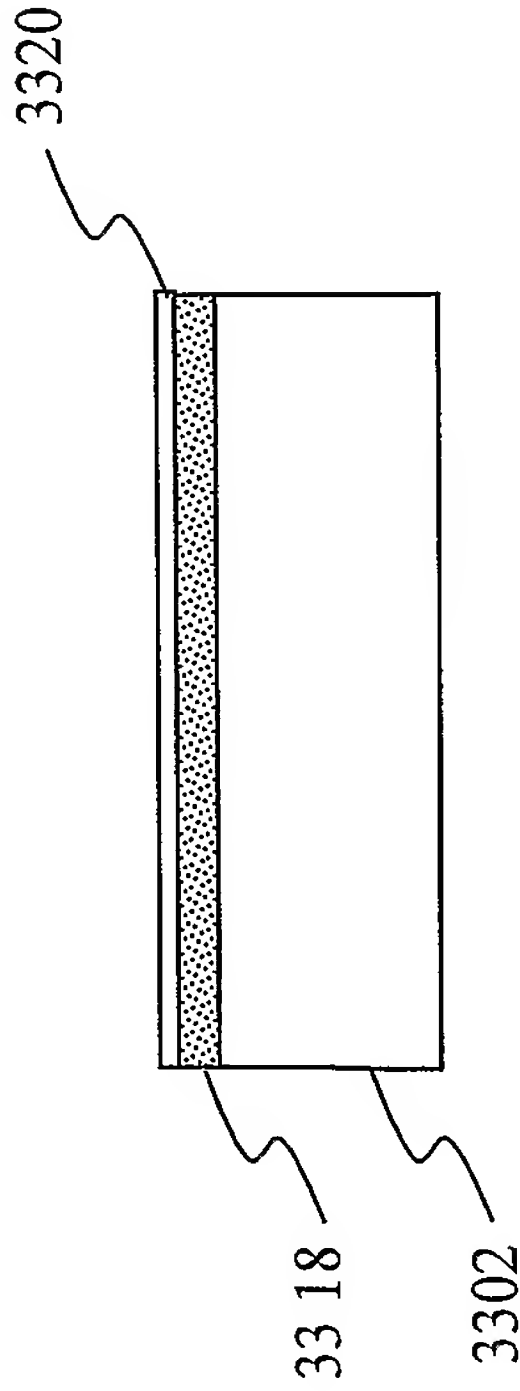


Figure 33C

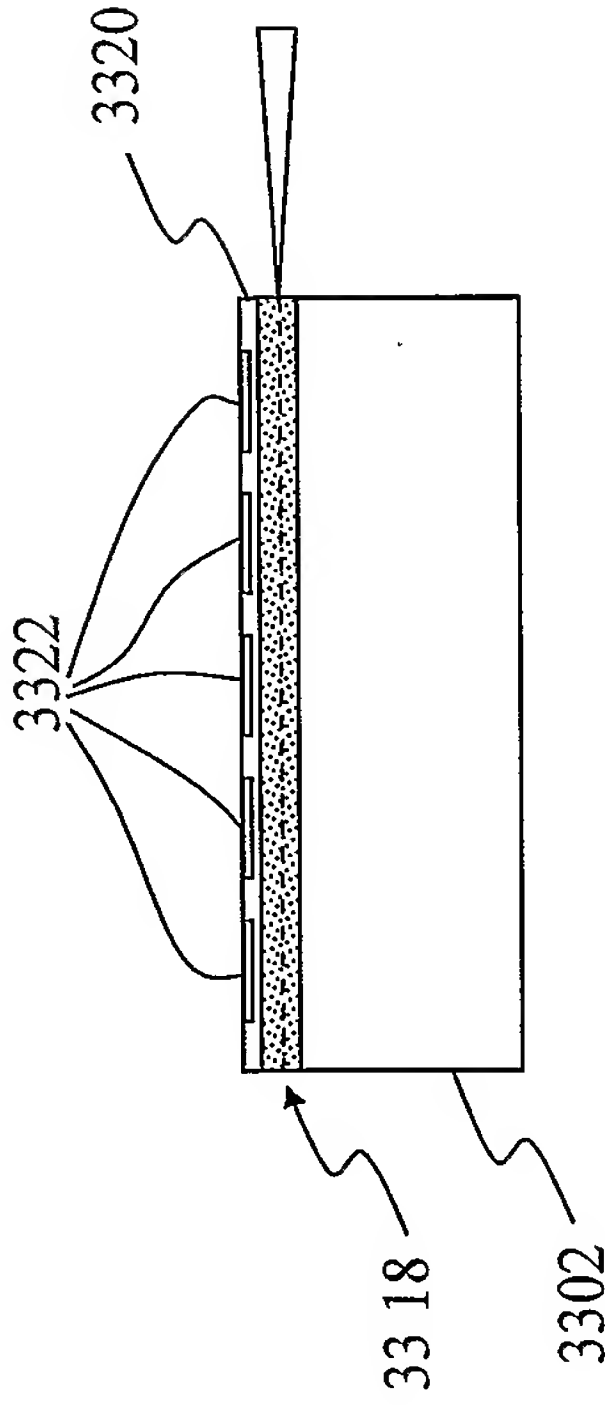


Figure 33E

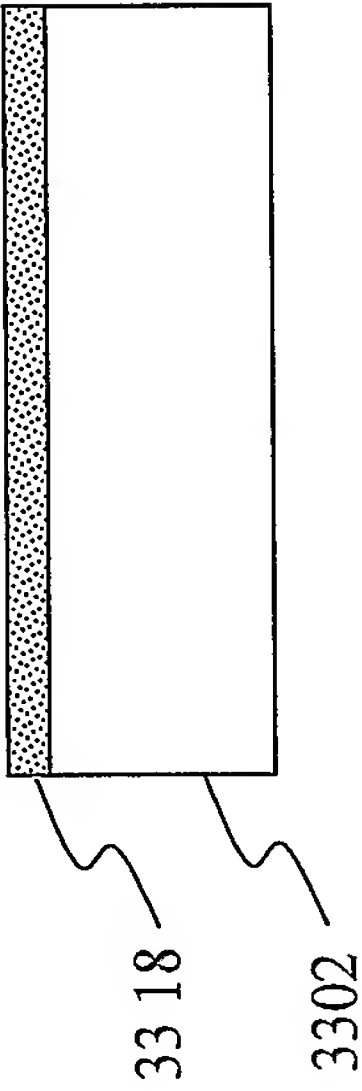


Figure 33B

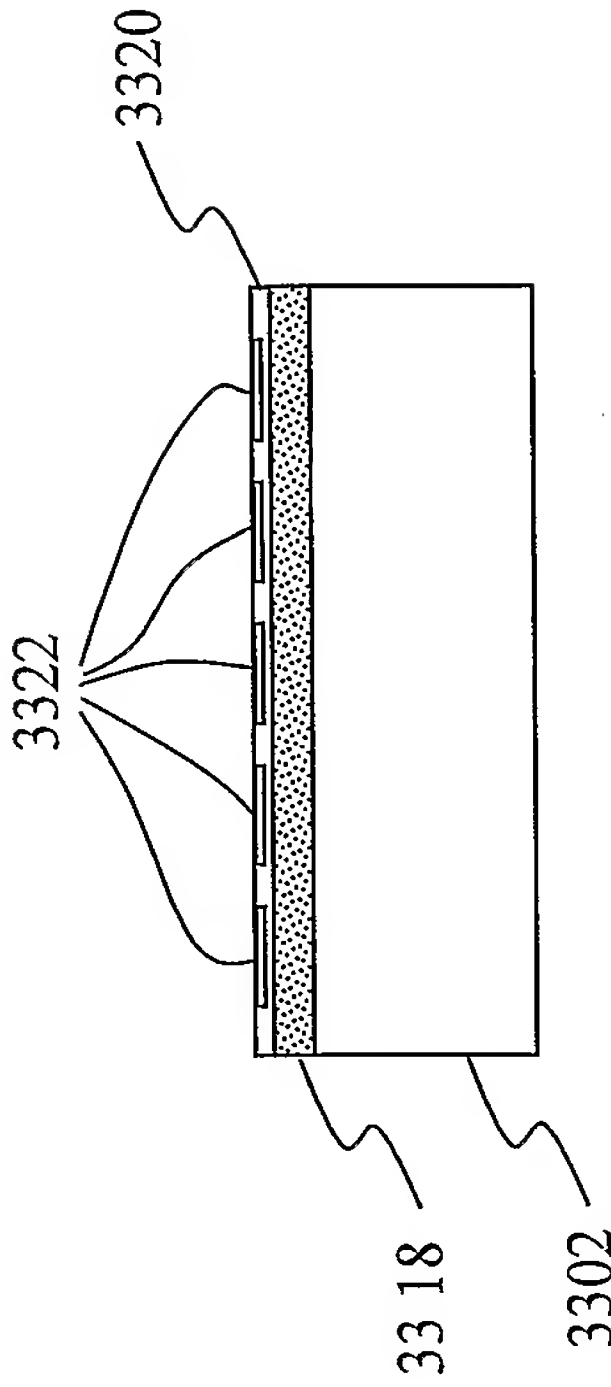


Figure 33D

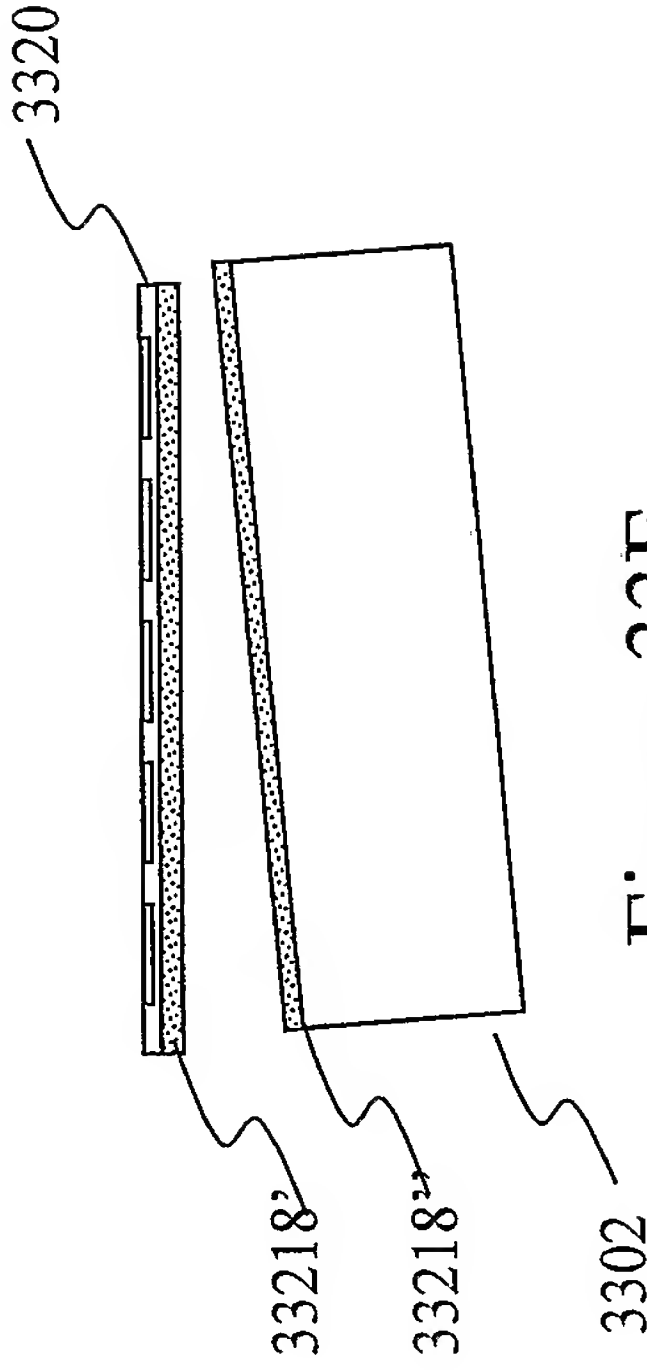
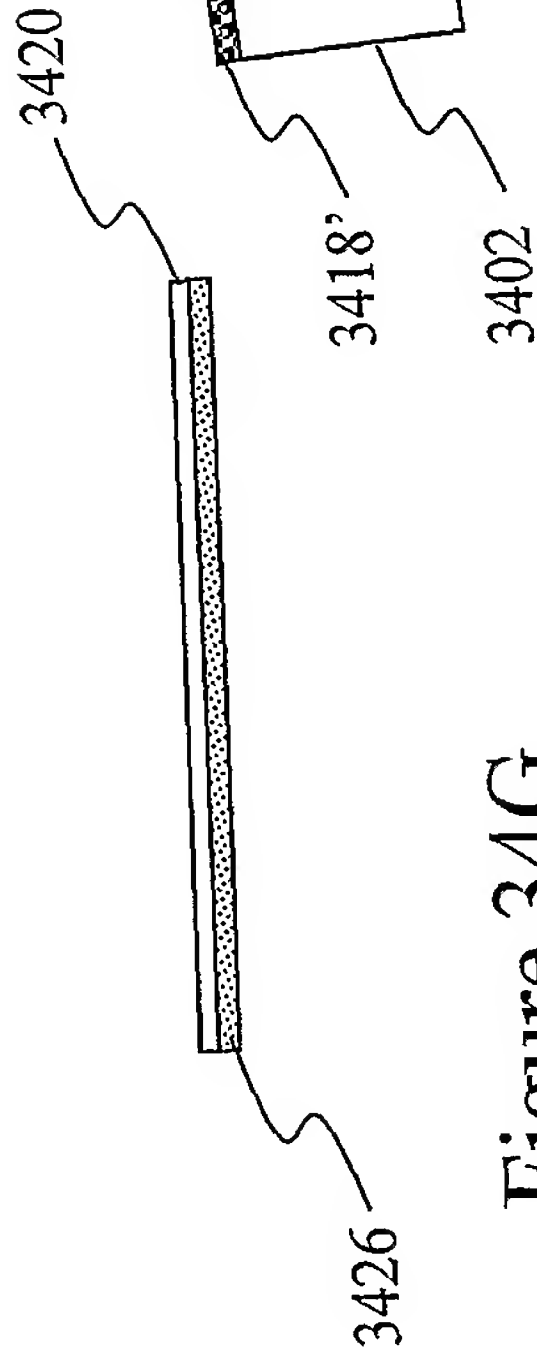
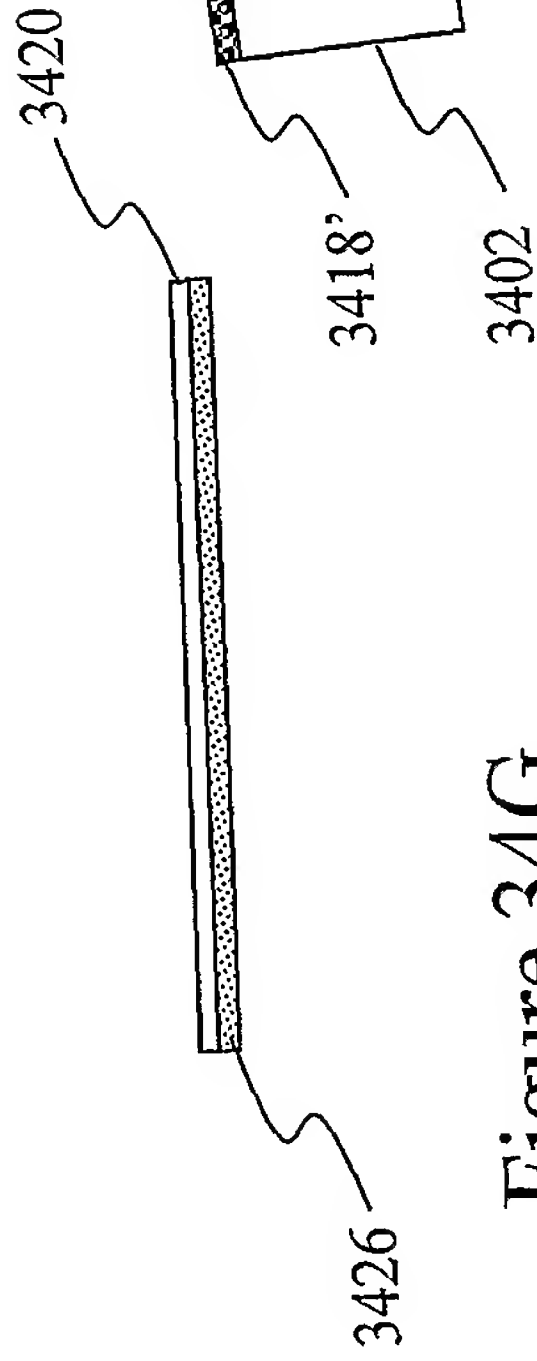
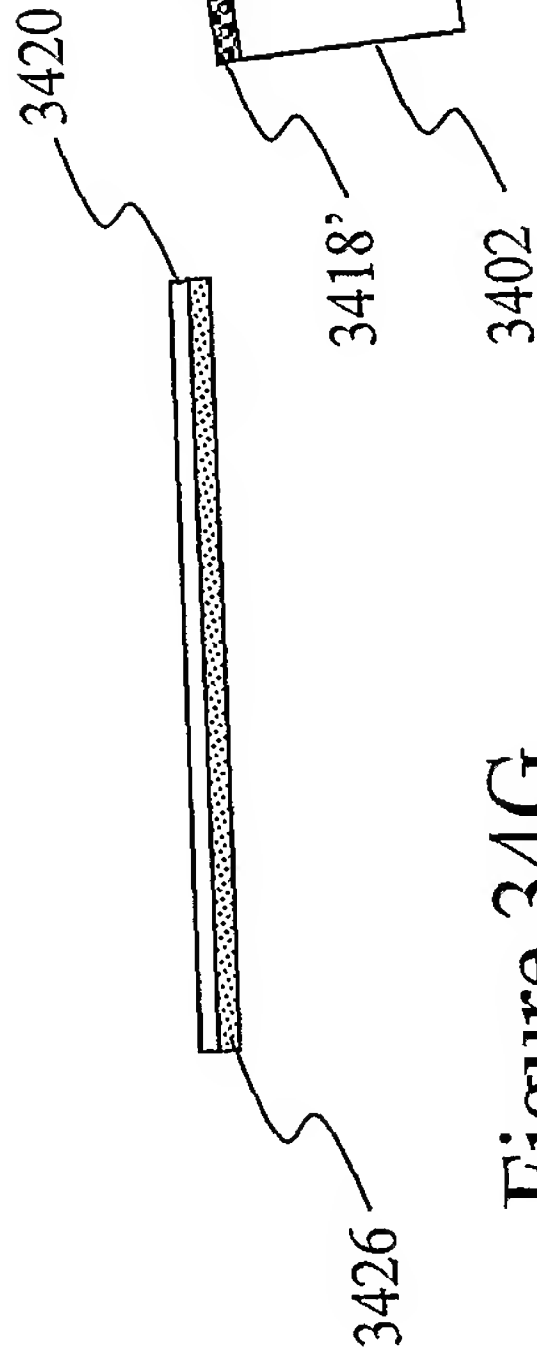
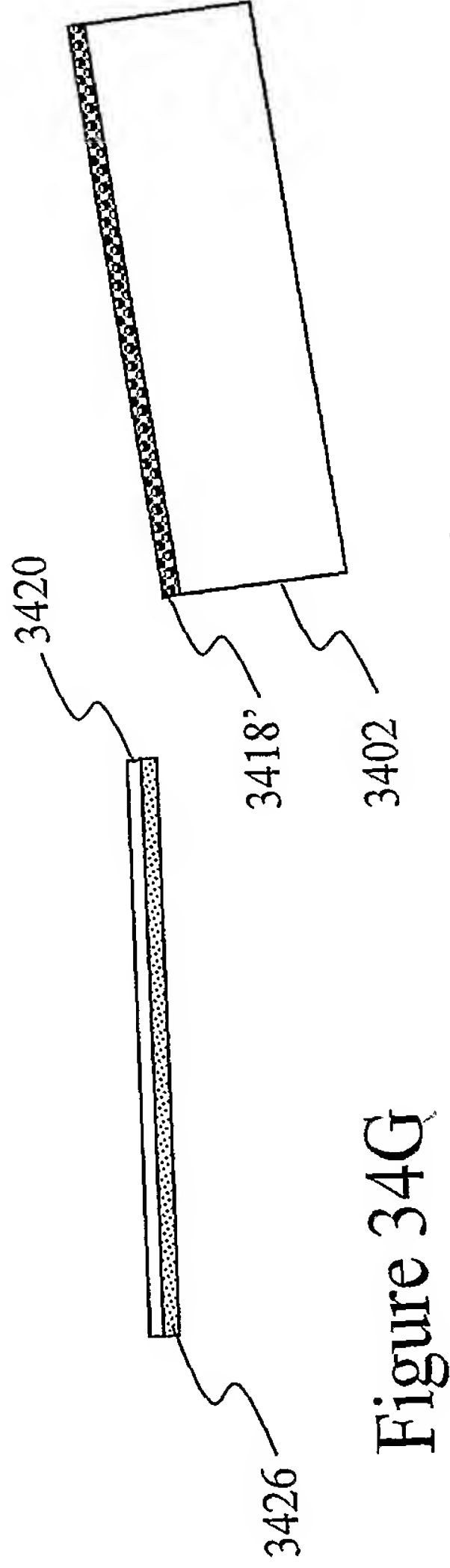
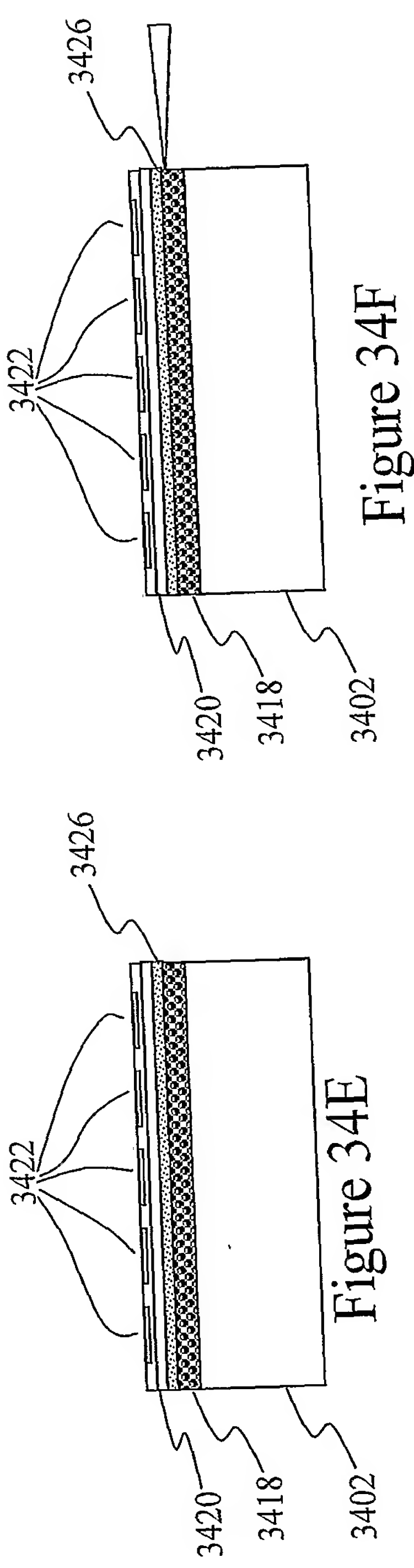
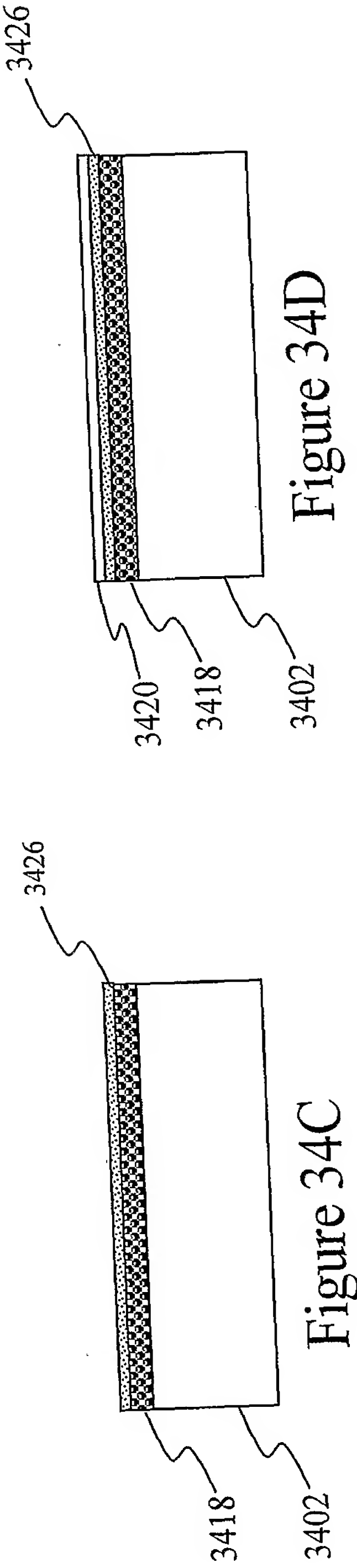
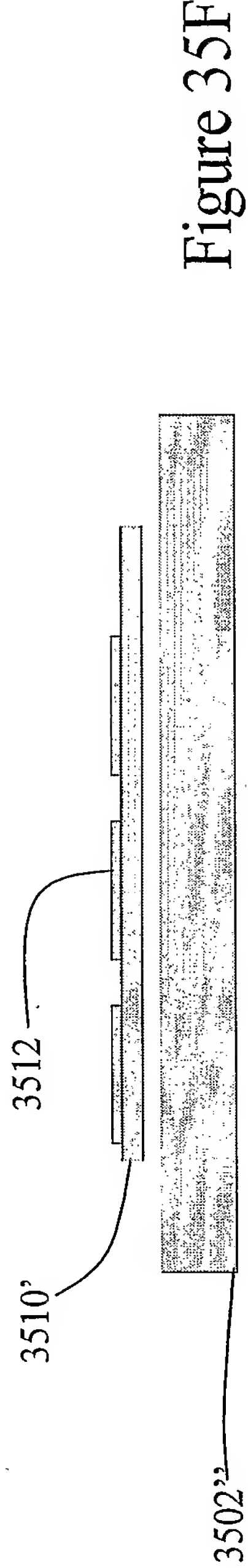
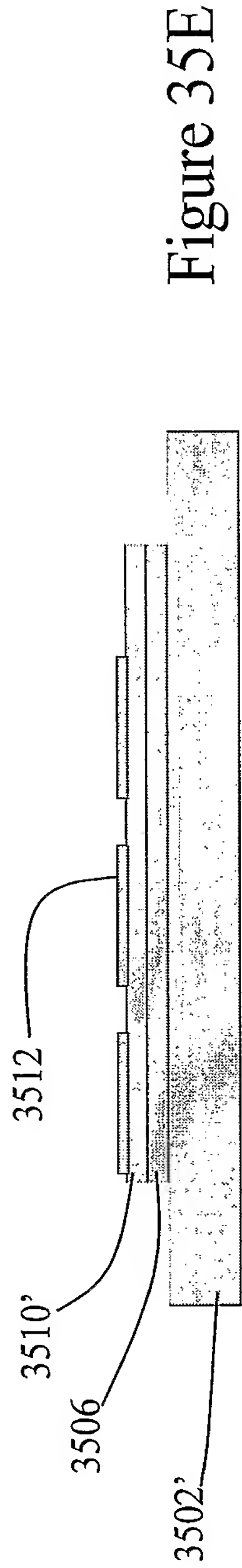
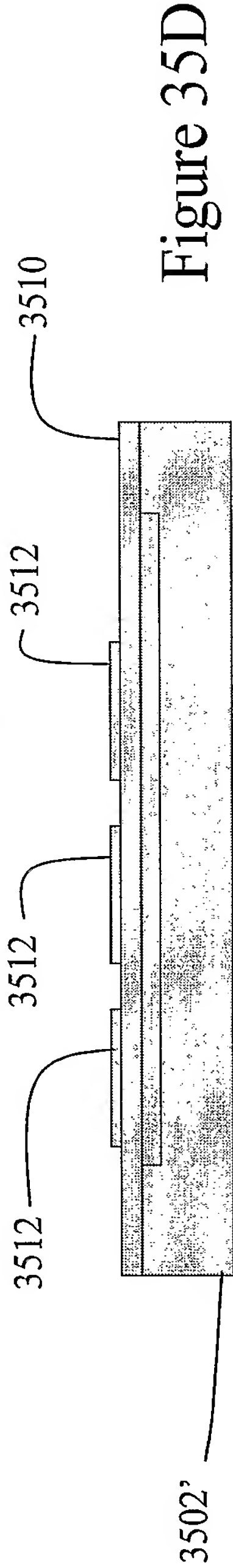
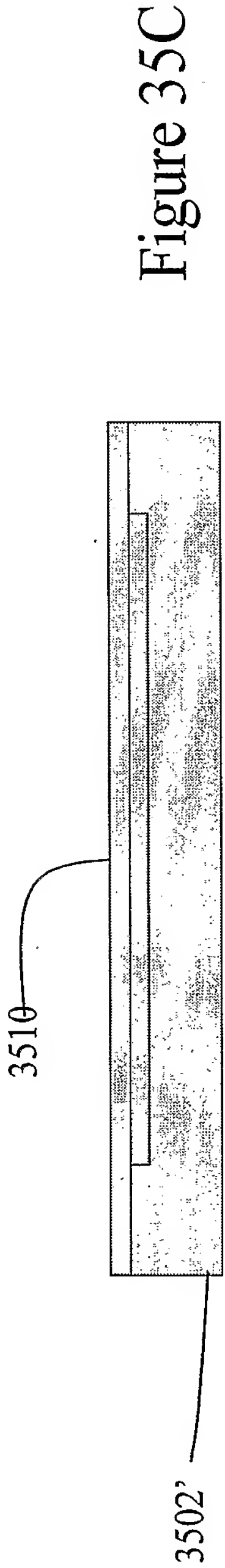
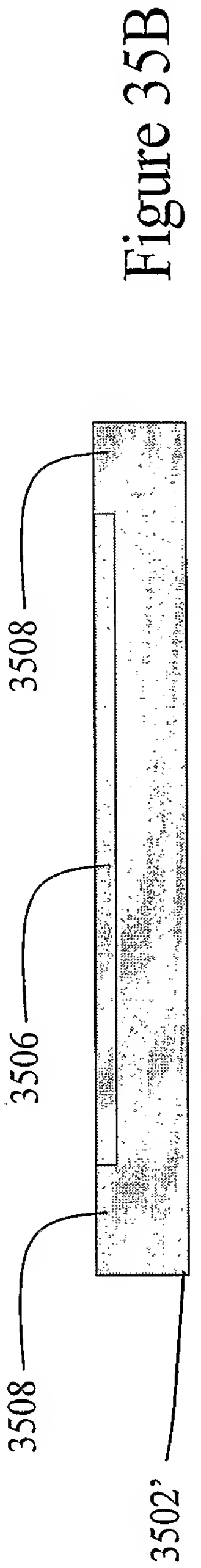
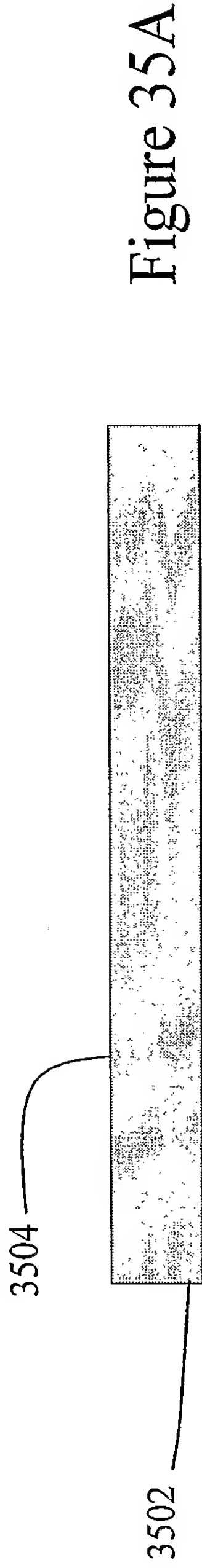


Figure 33F





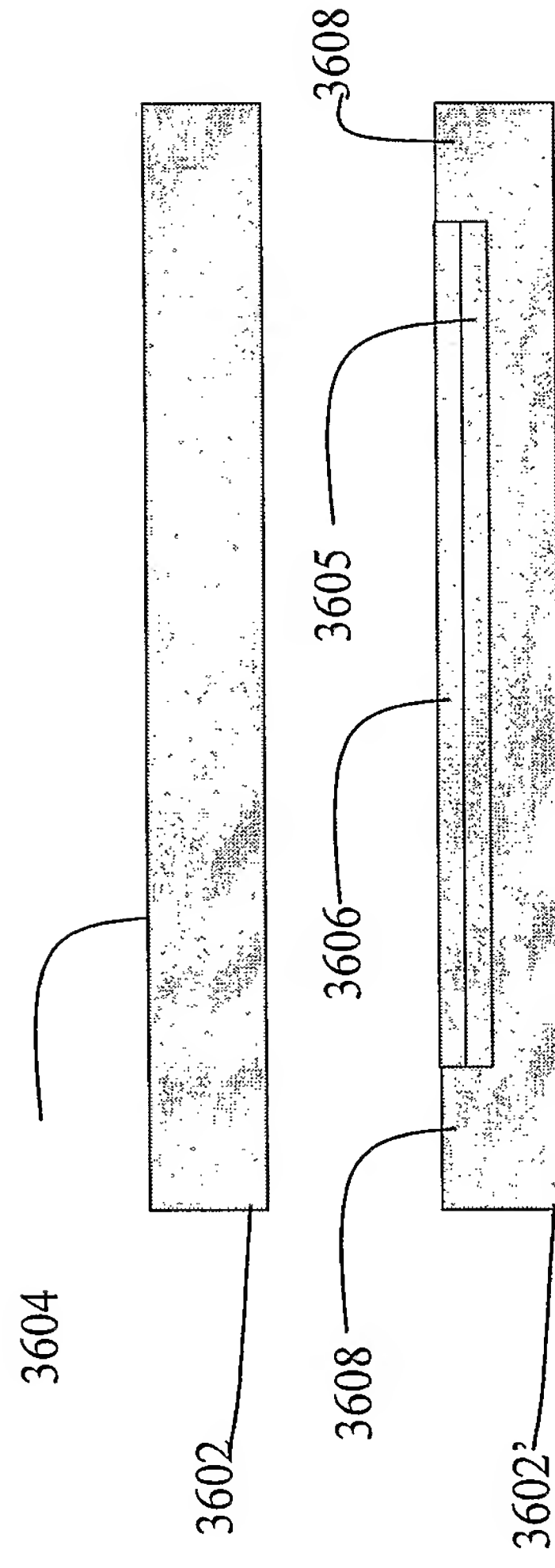


Figure 36A

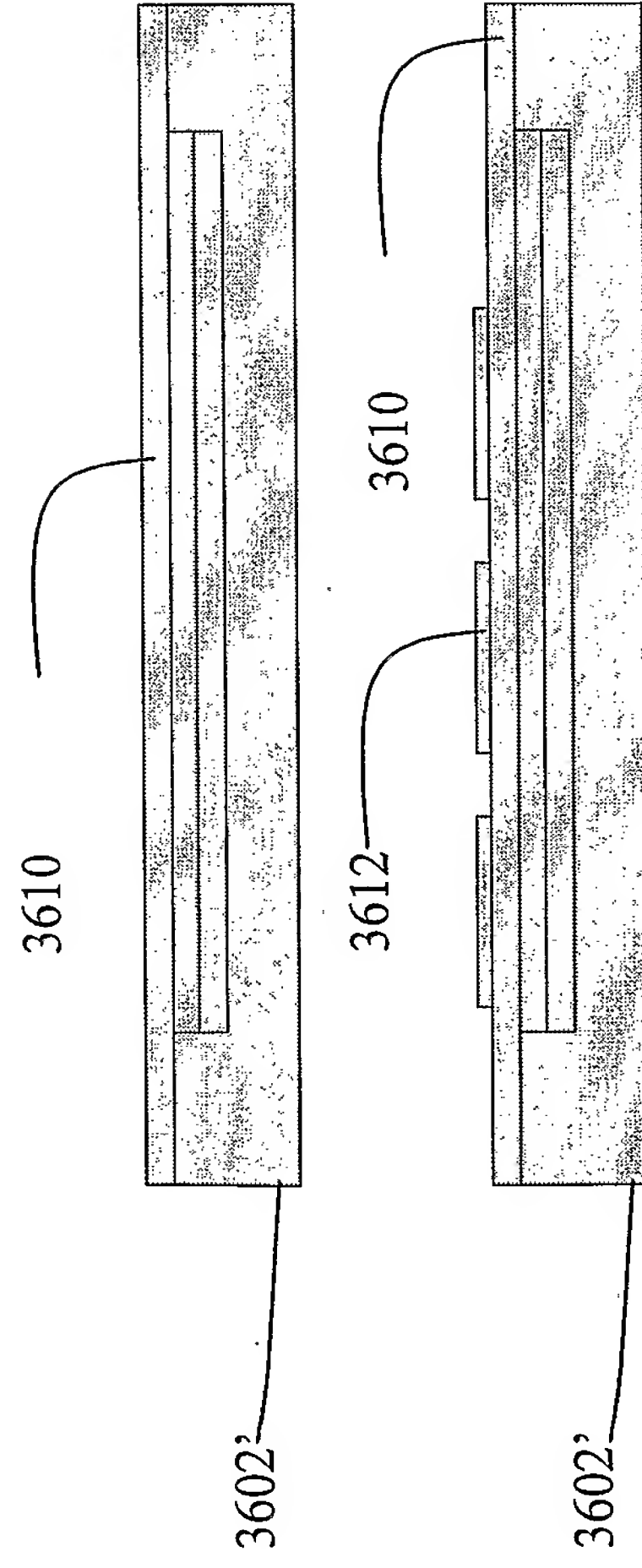


Figure 36B

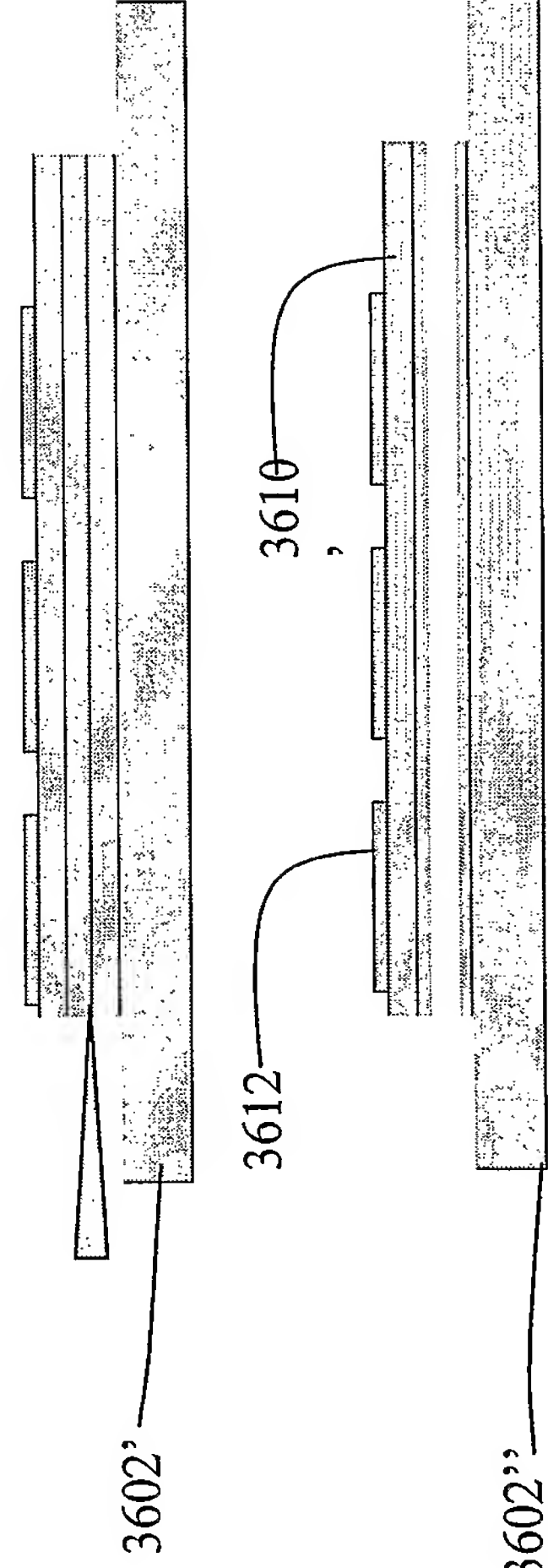


Figure 36C

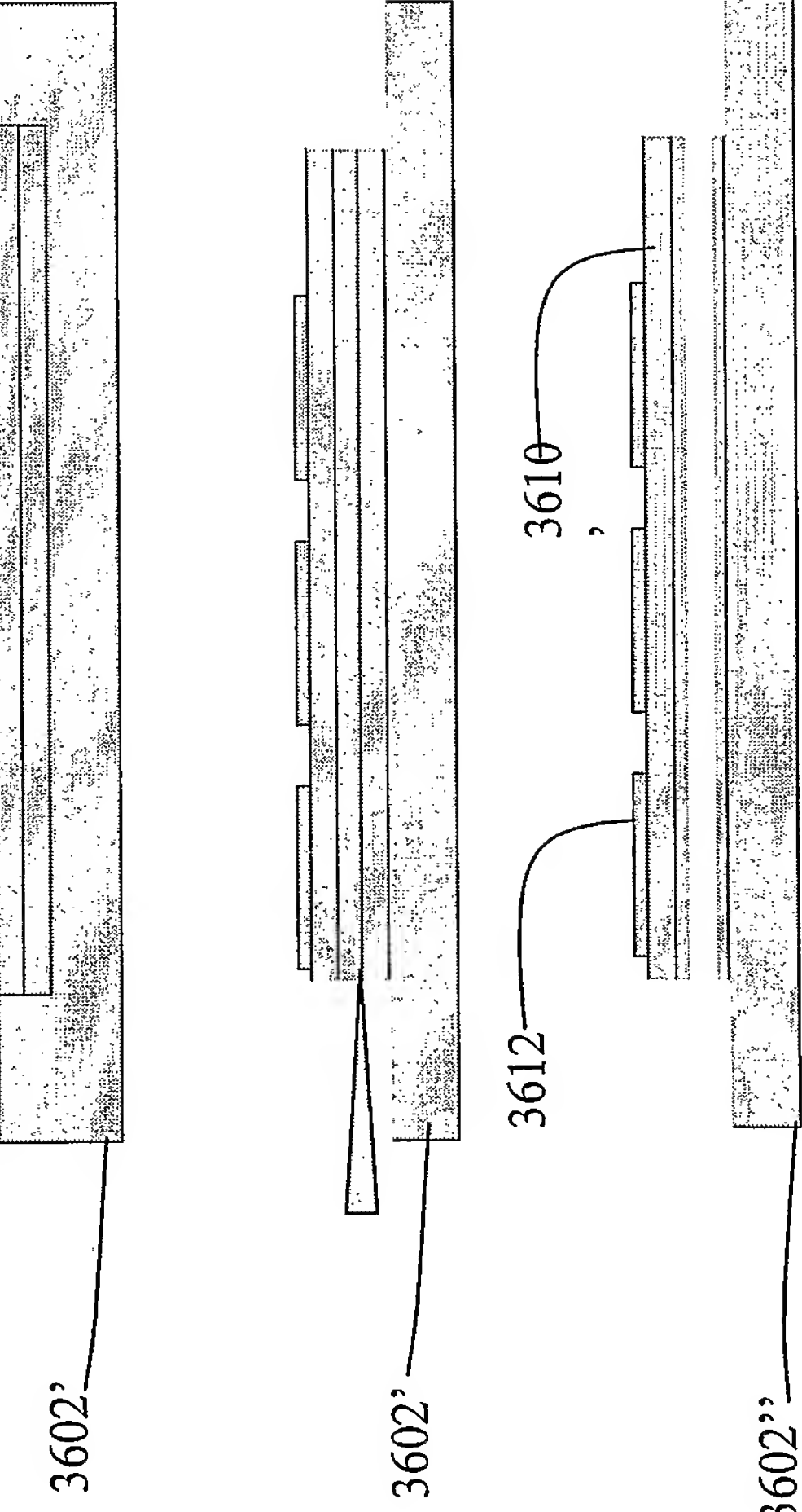


Figure 36D

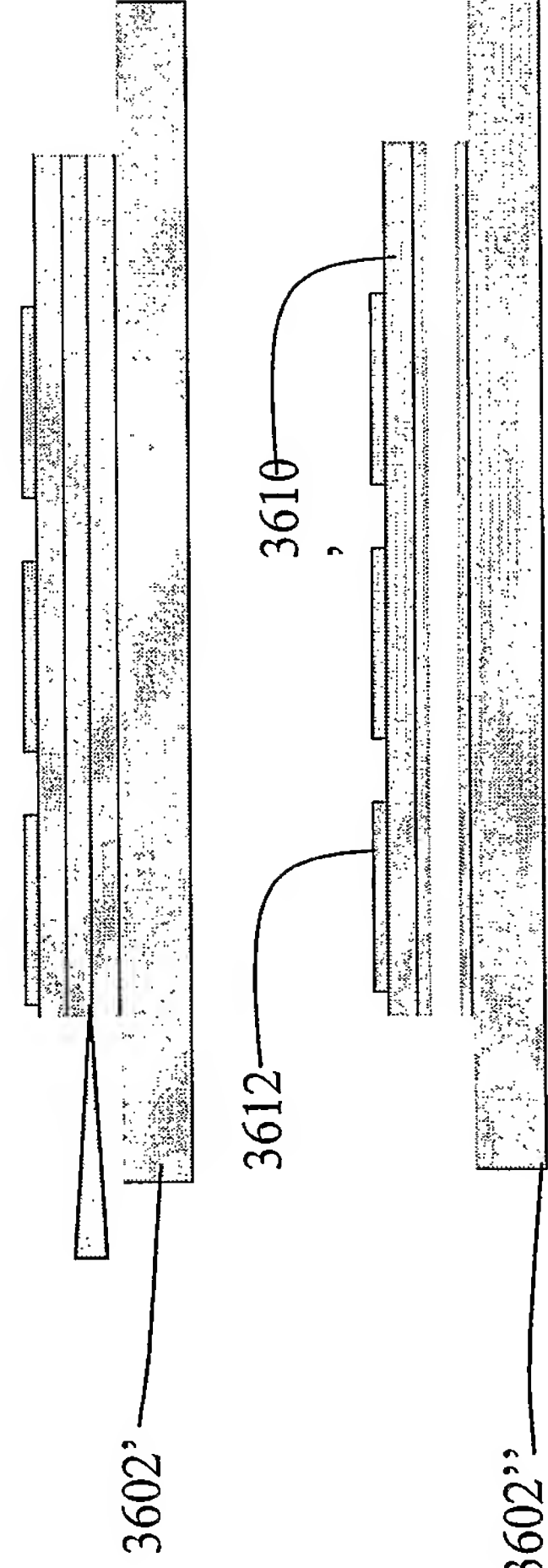
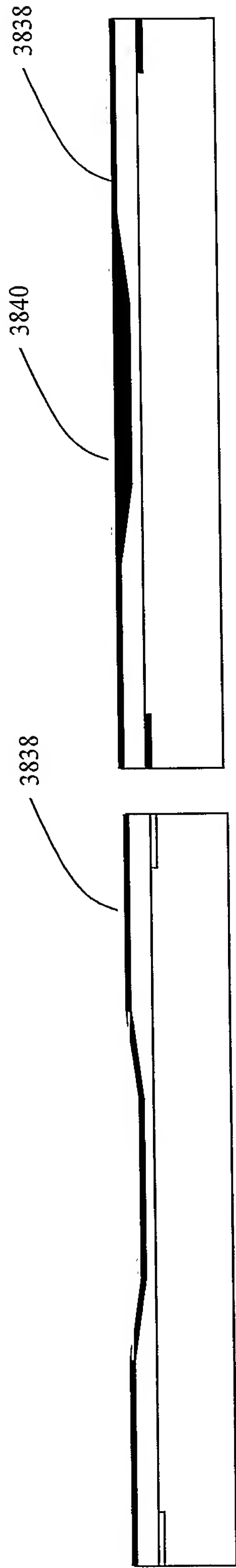
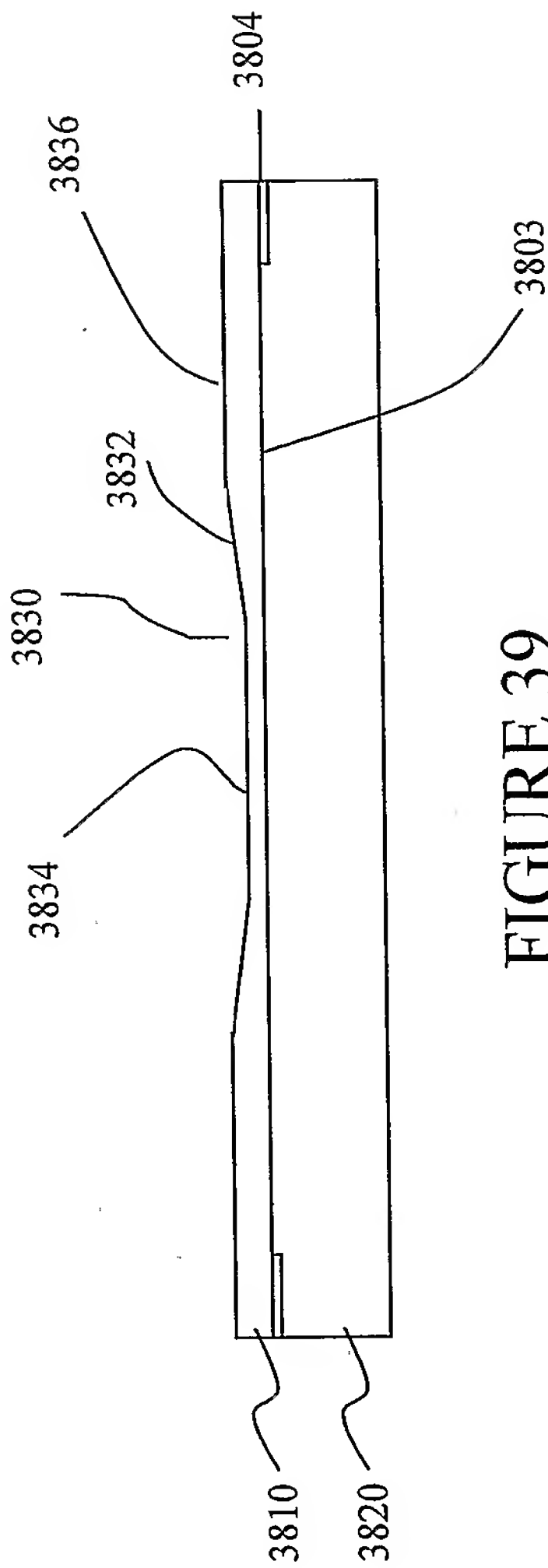
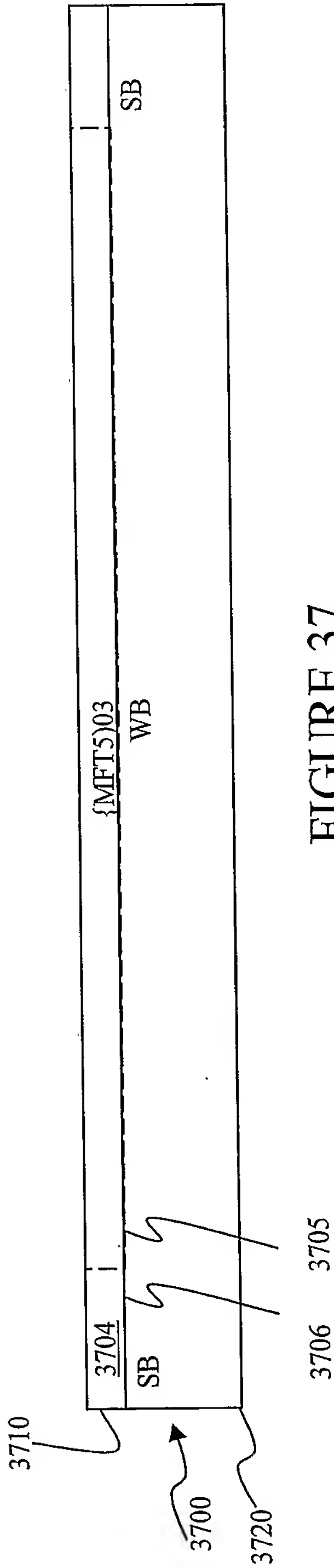


Figure 36E



Figure 36F



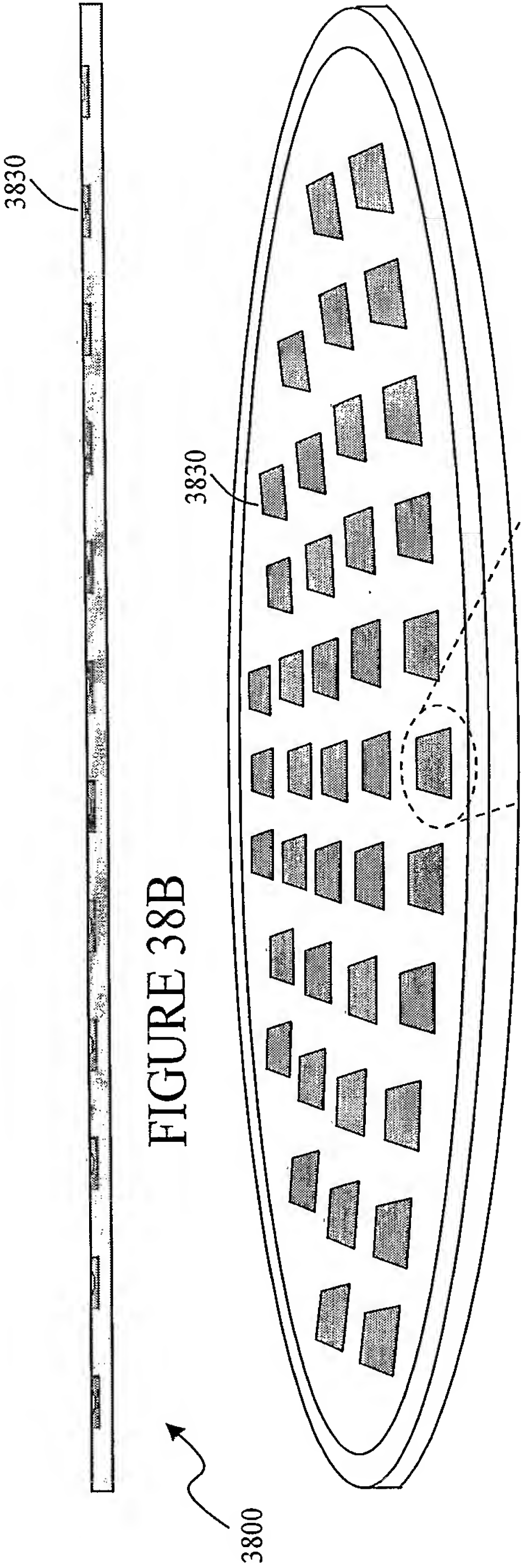


FIGURE 38A

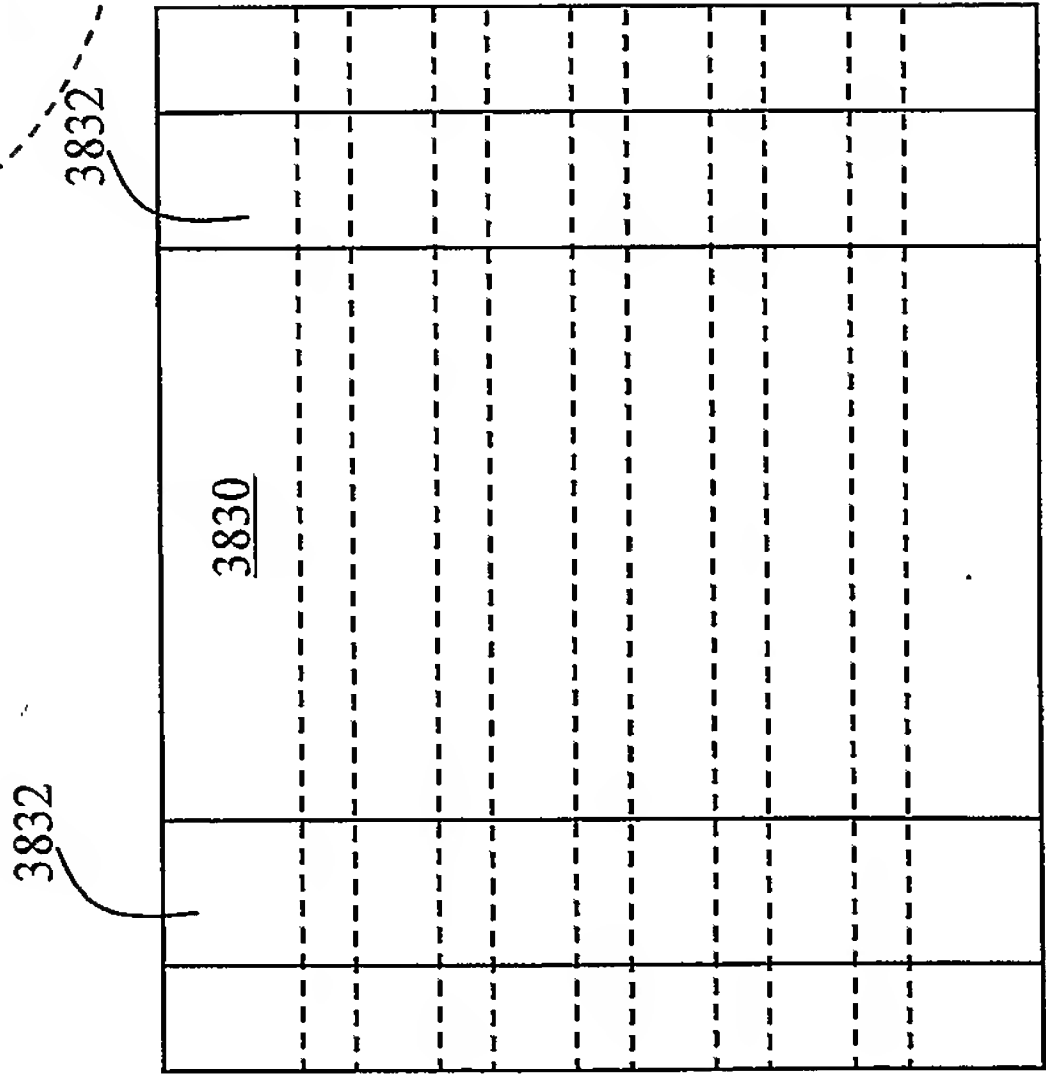
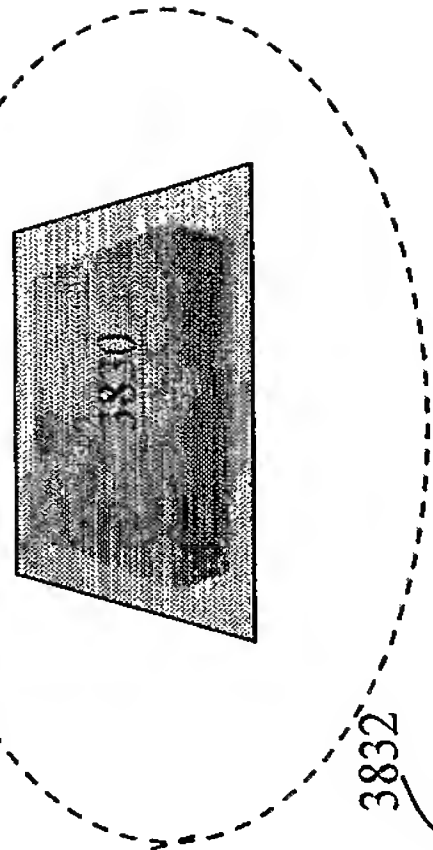


FIGURE 38C

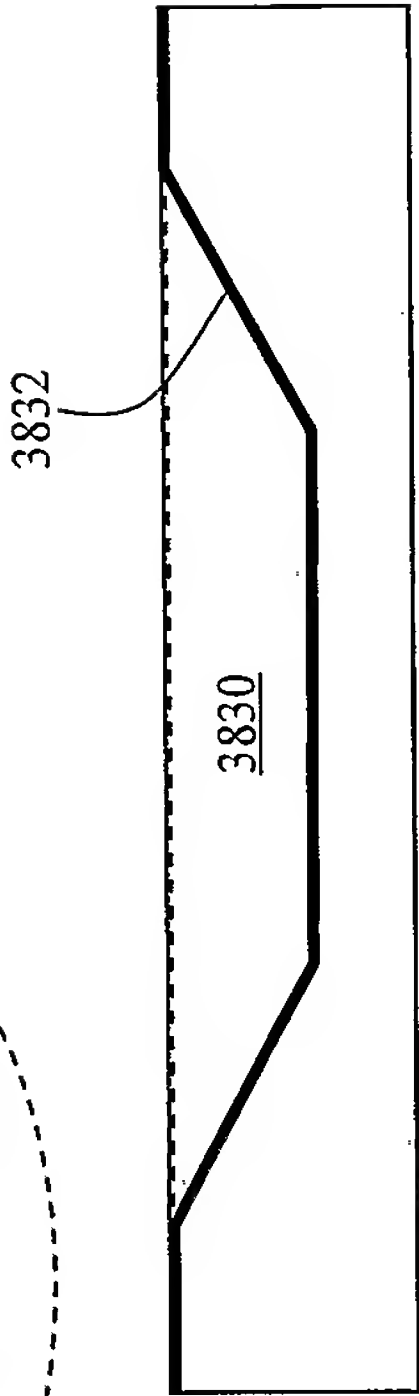


FIGURE 38D

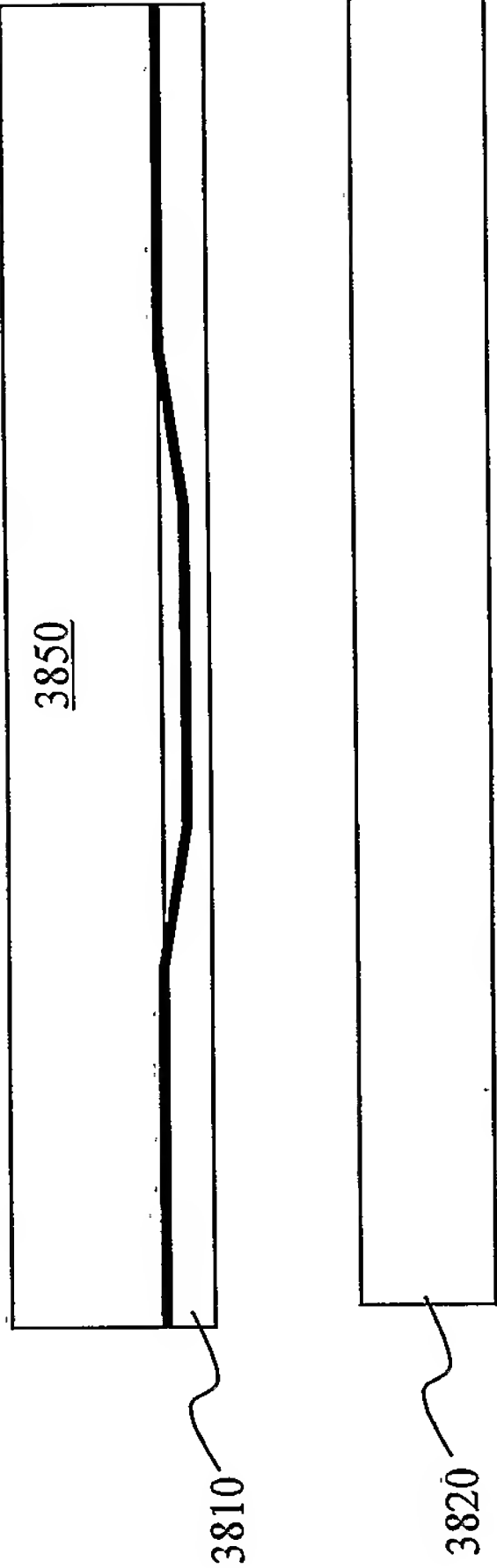


FIGURE 41

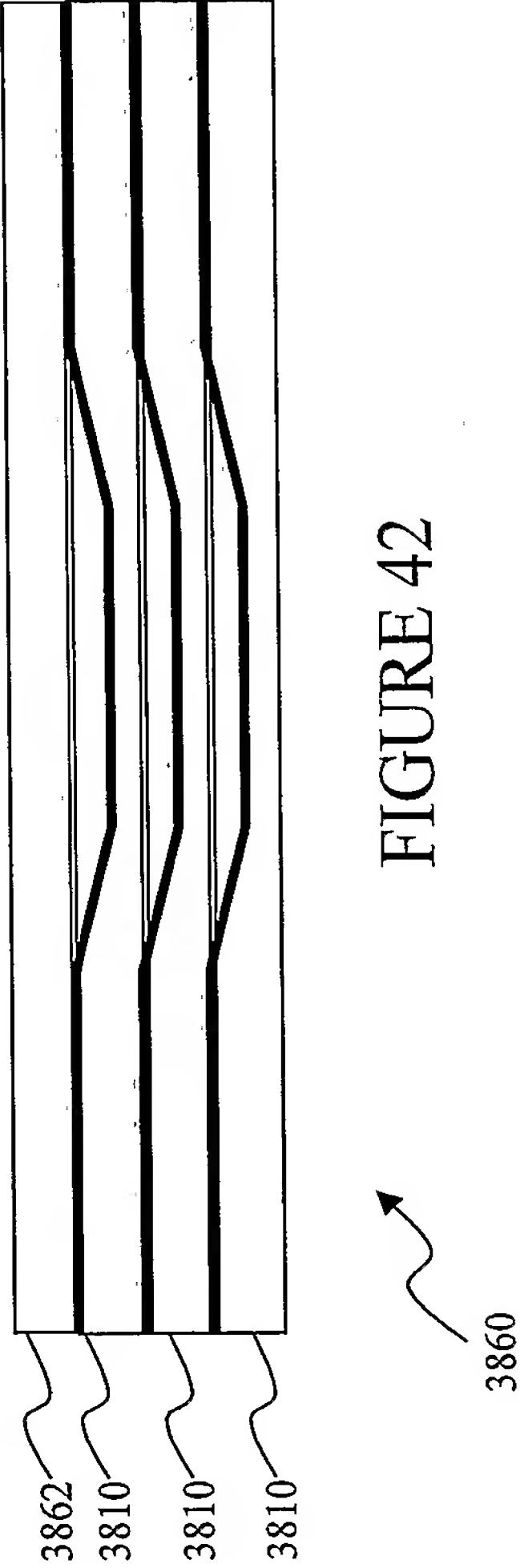


FIGURE 42

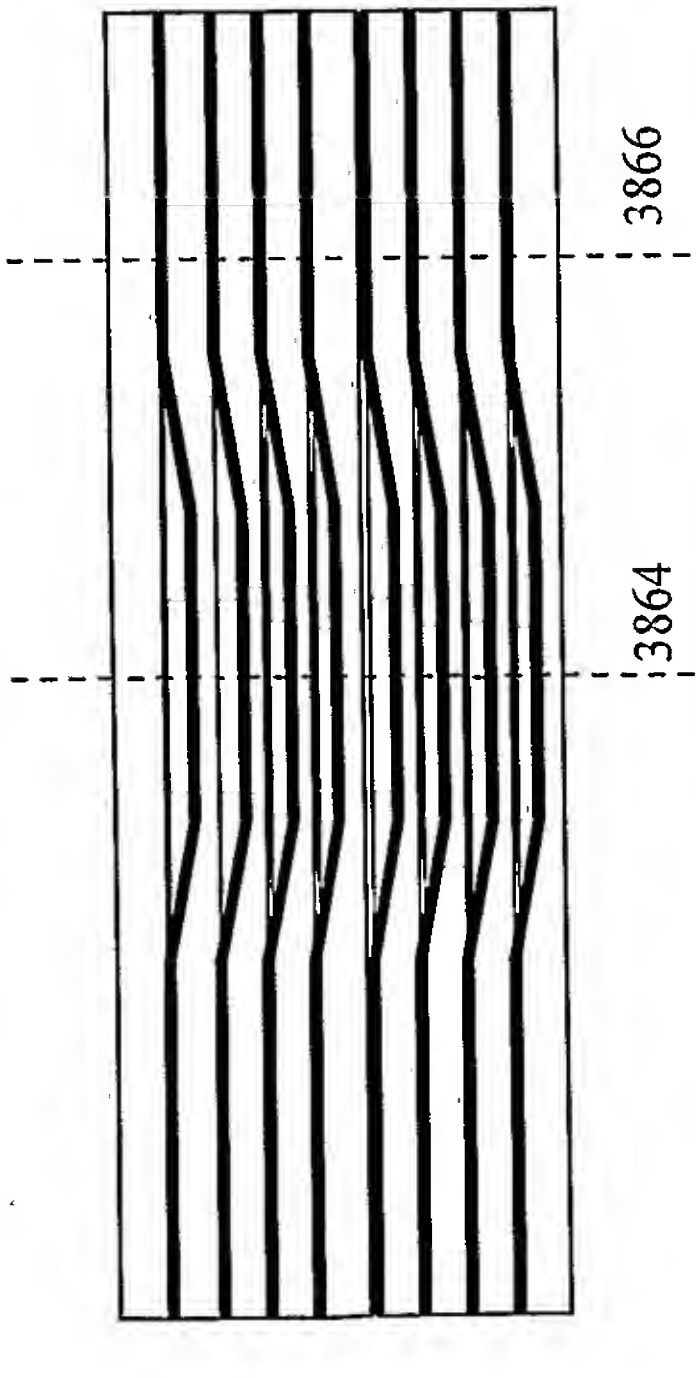


FIGURE 43

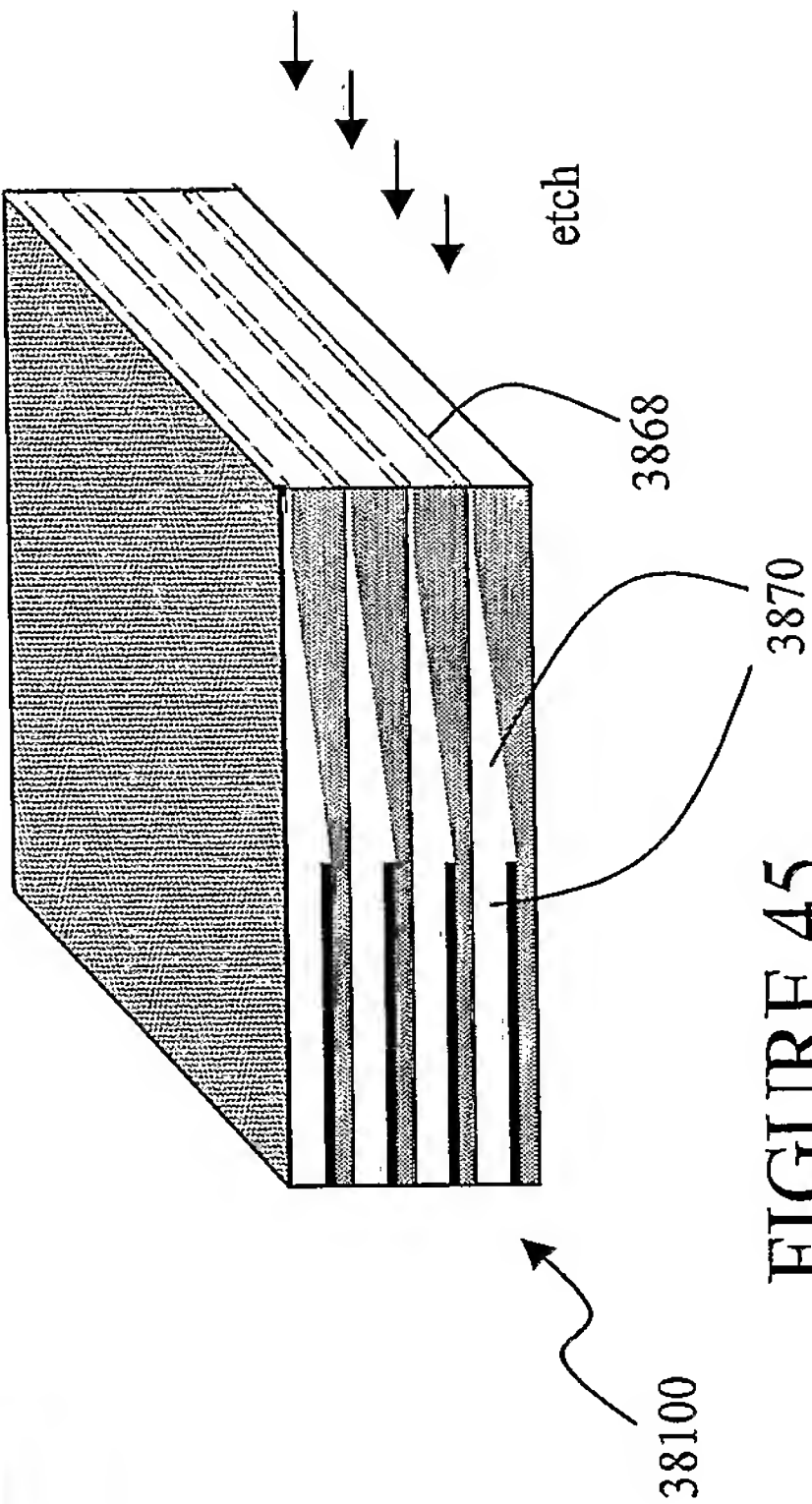


FIGURE 45

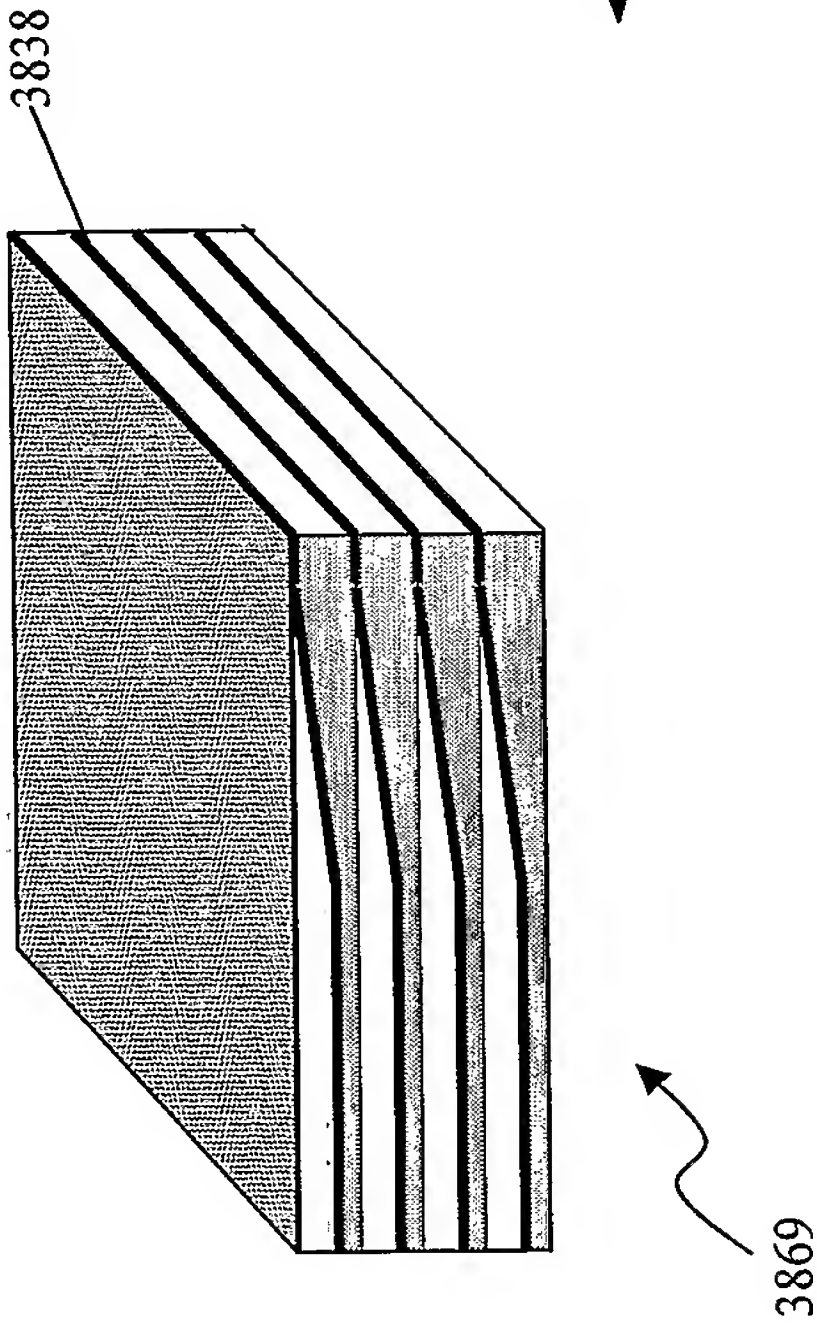


FIGURE 44

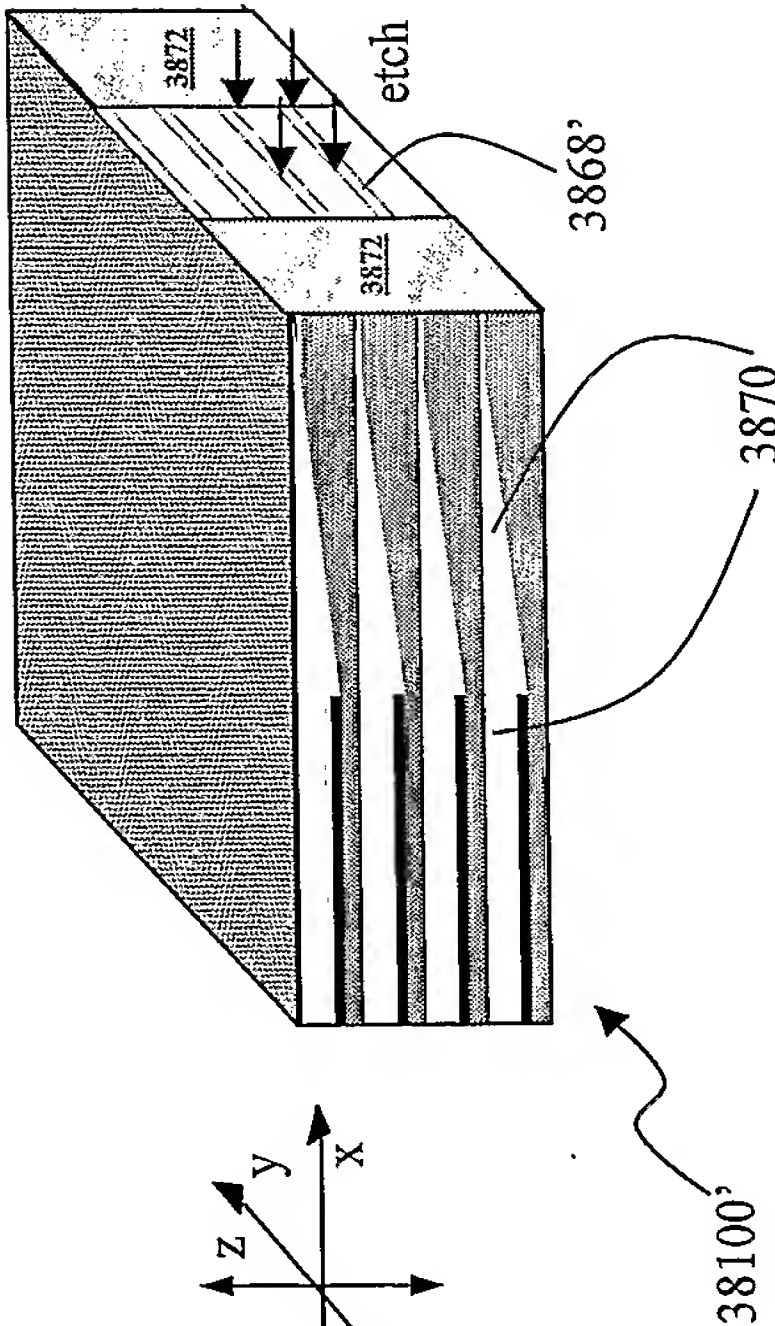
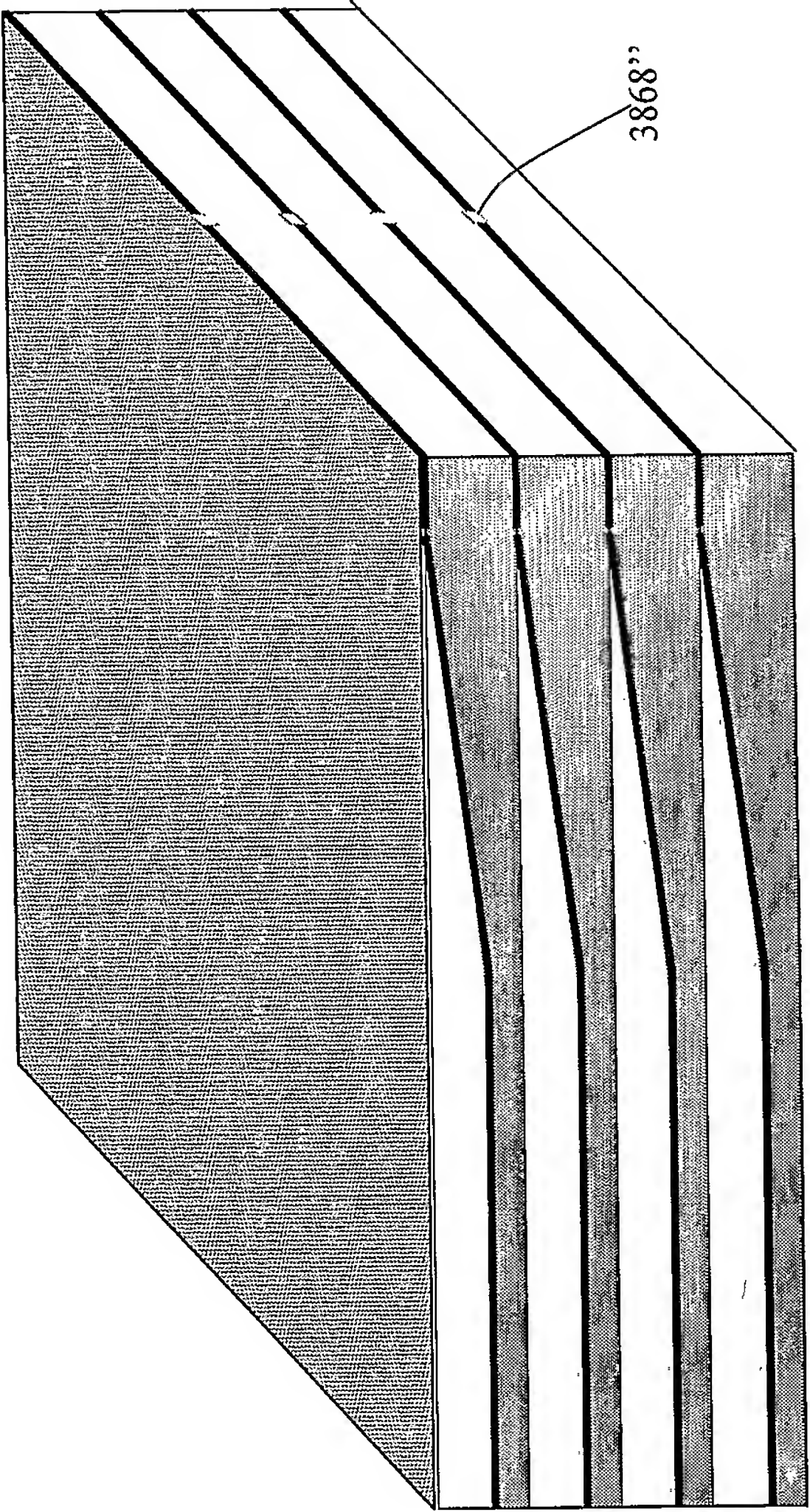
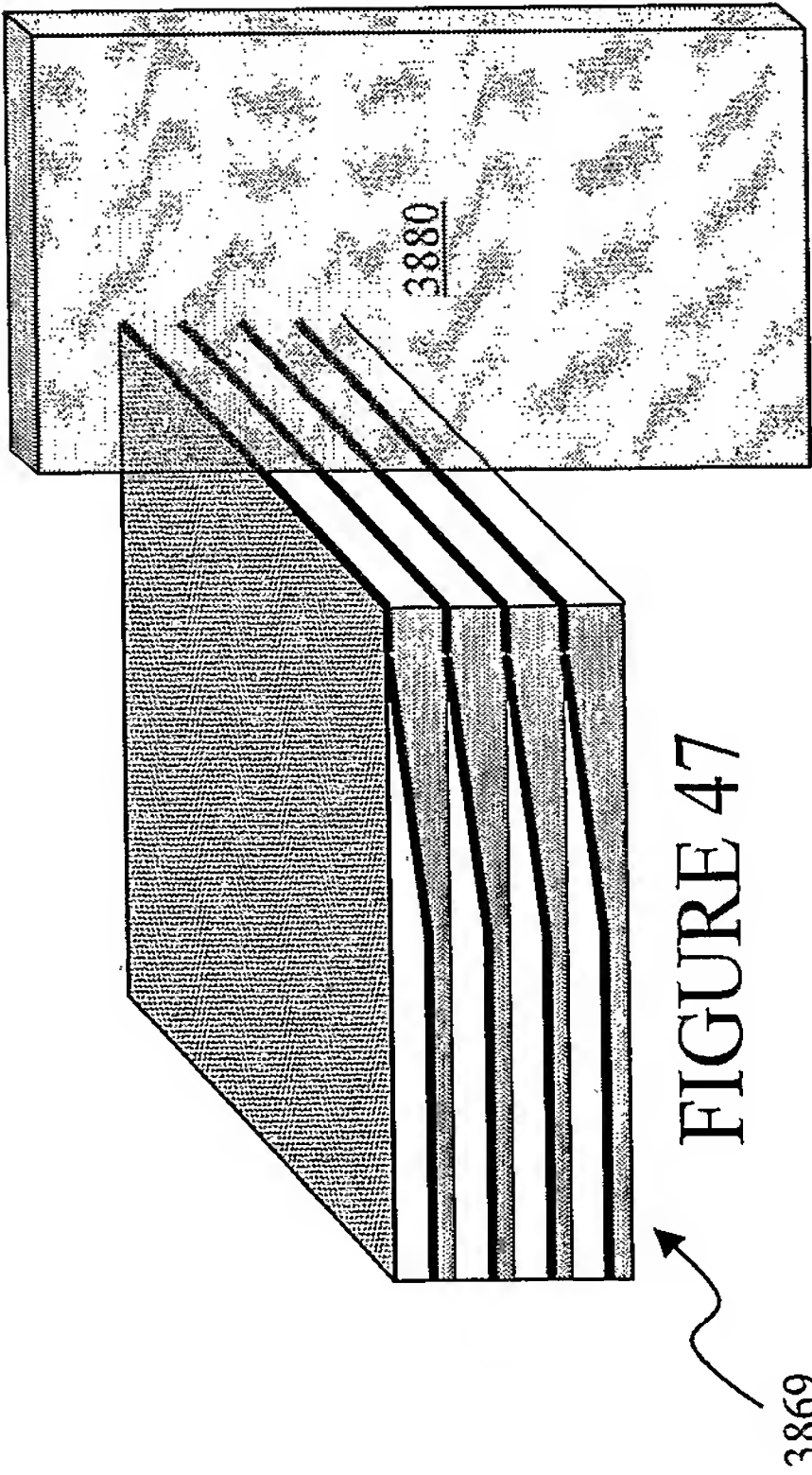
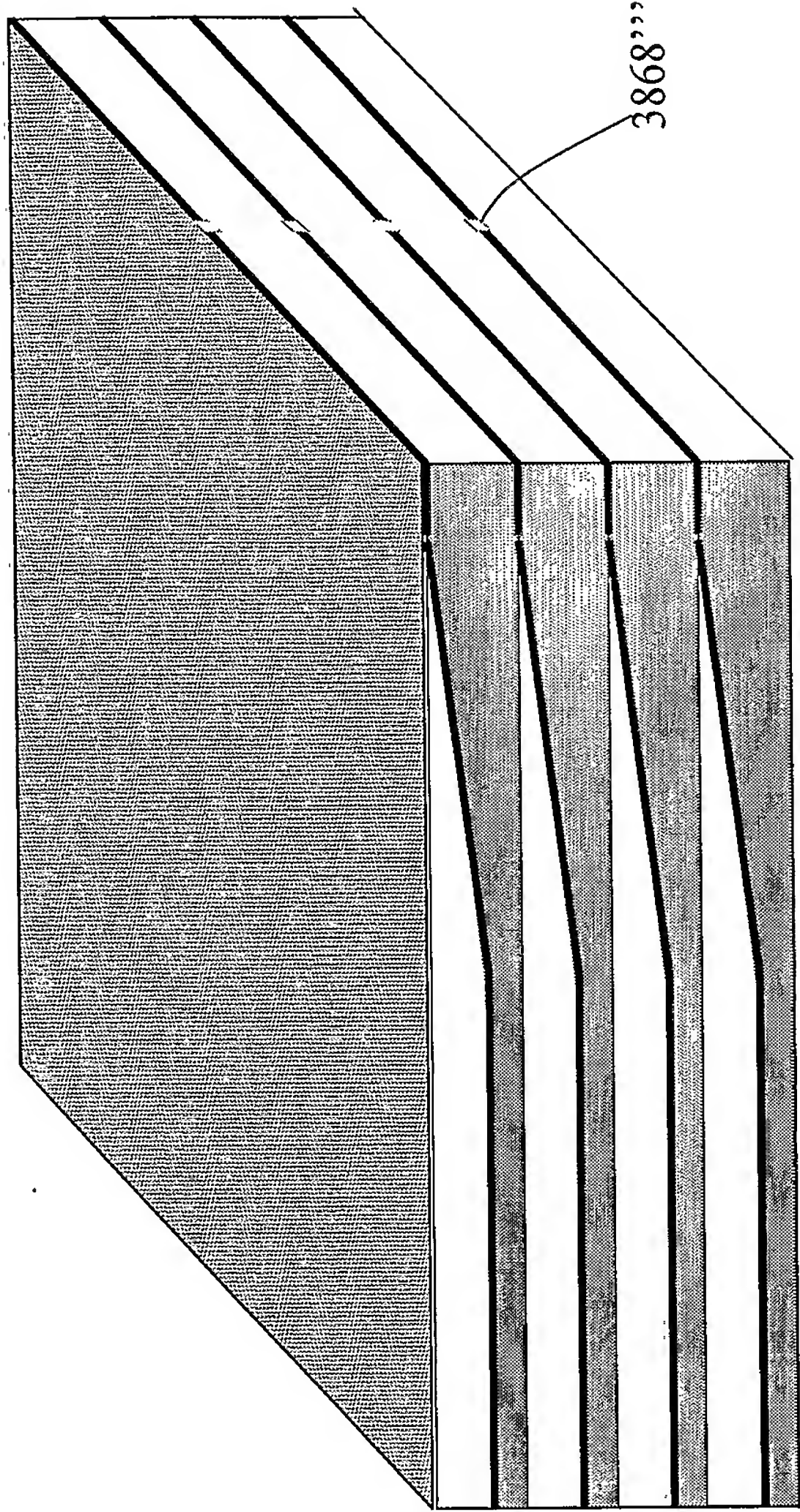
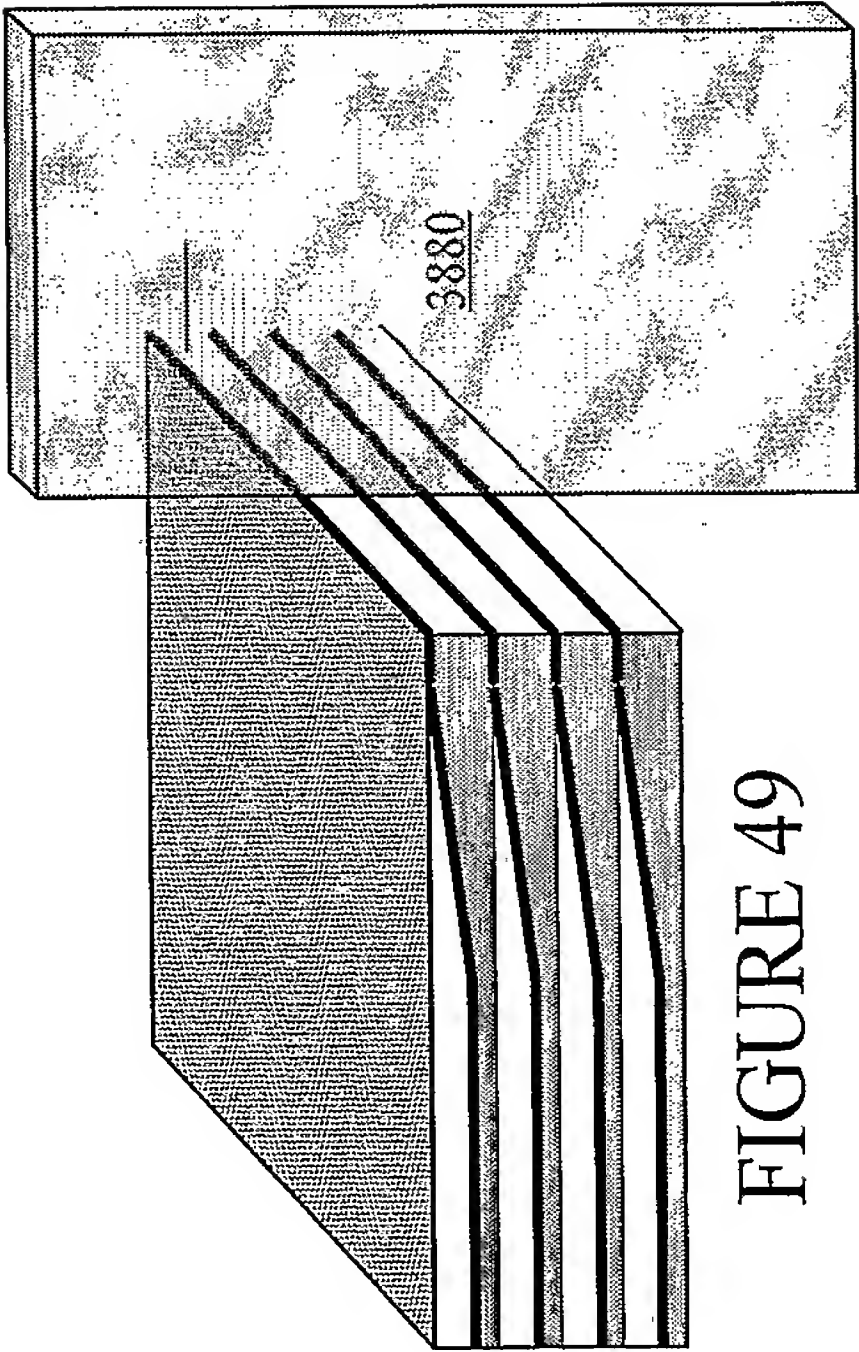


FIGURE 46





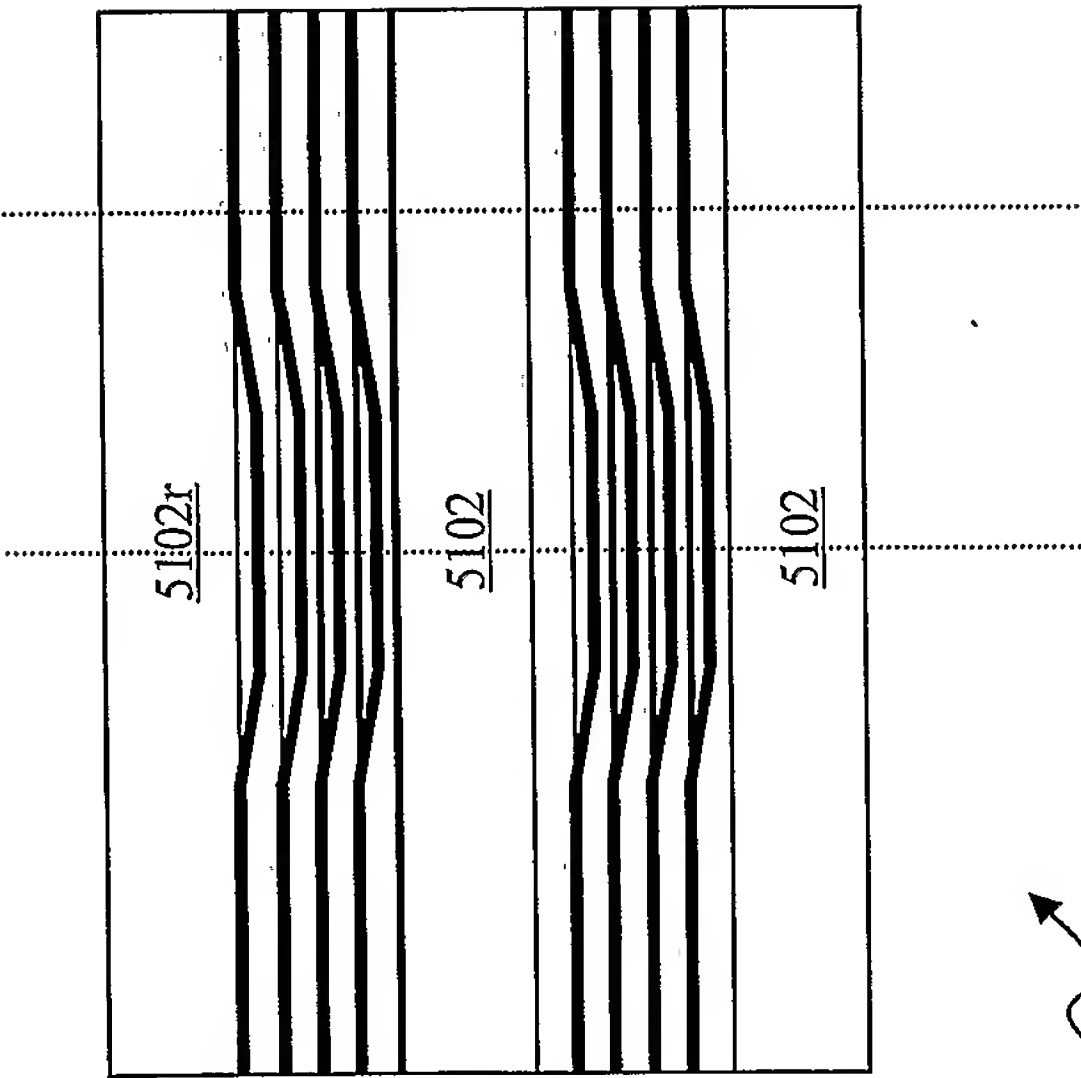


FIGURE 51A

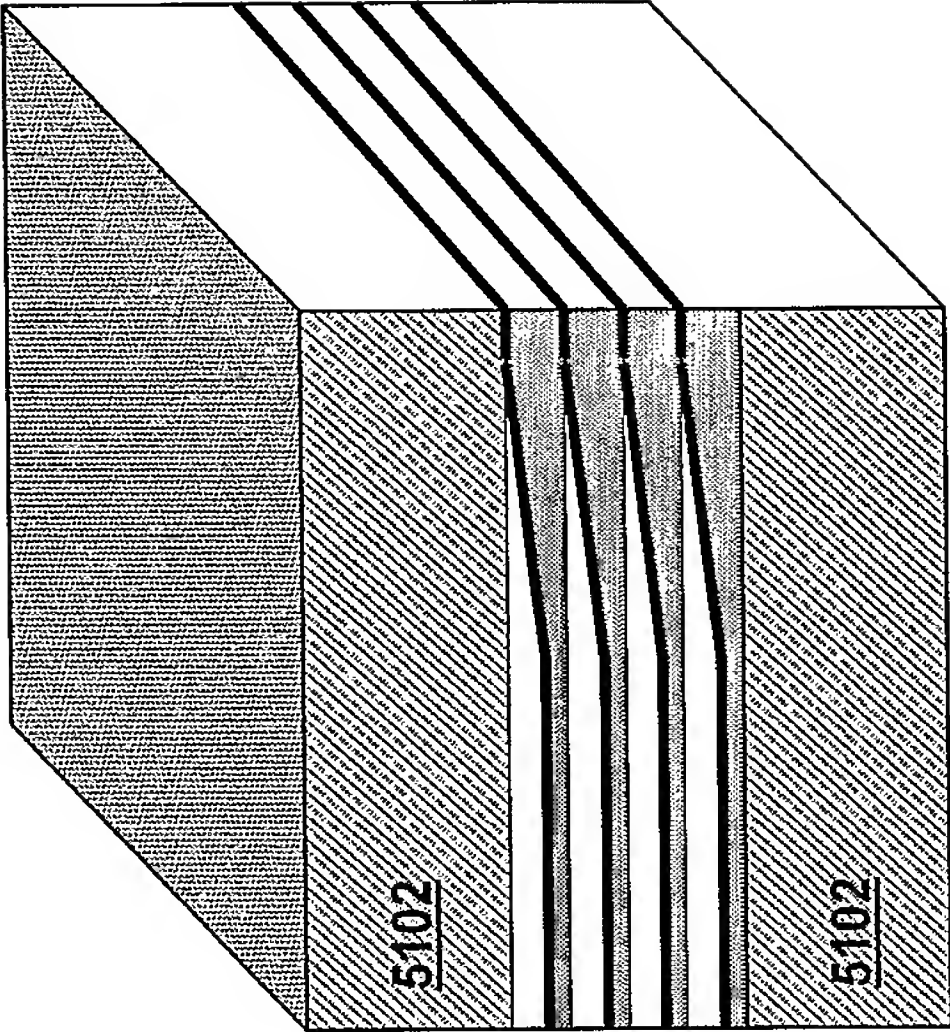


FIGURE 51B

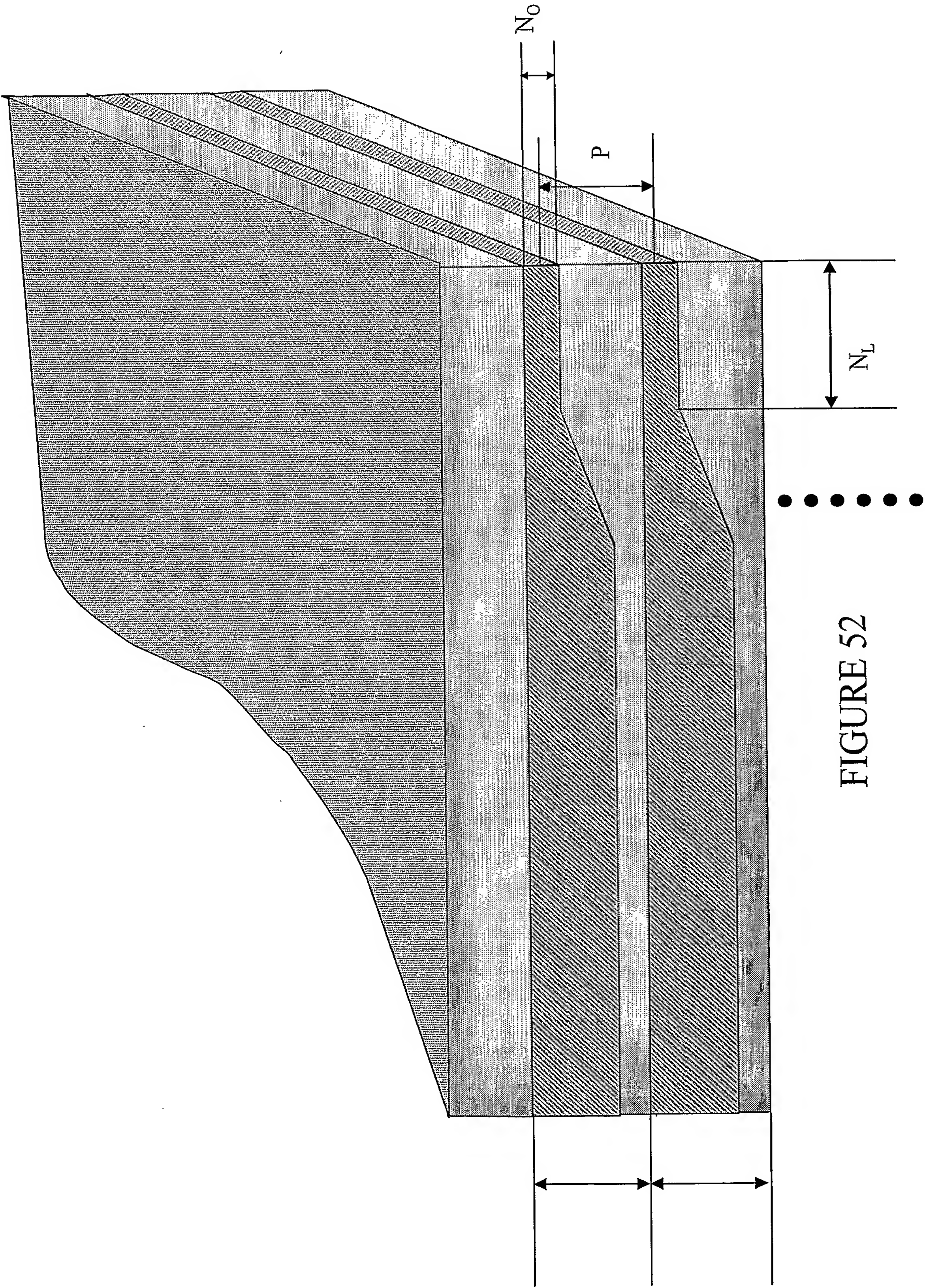


FIGURE 52

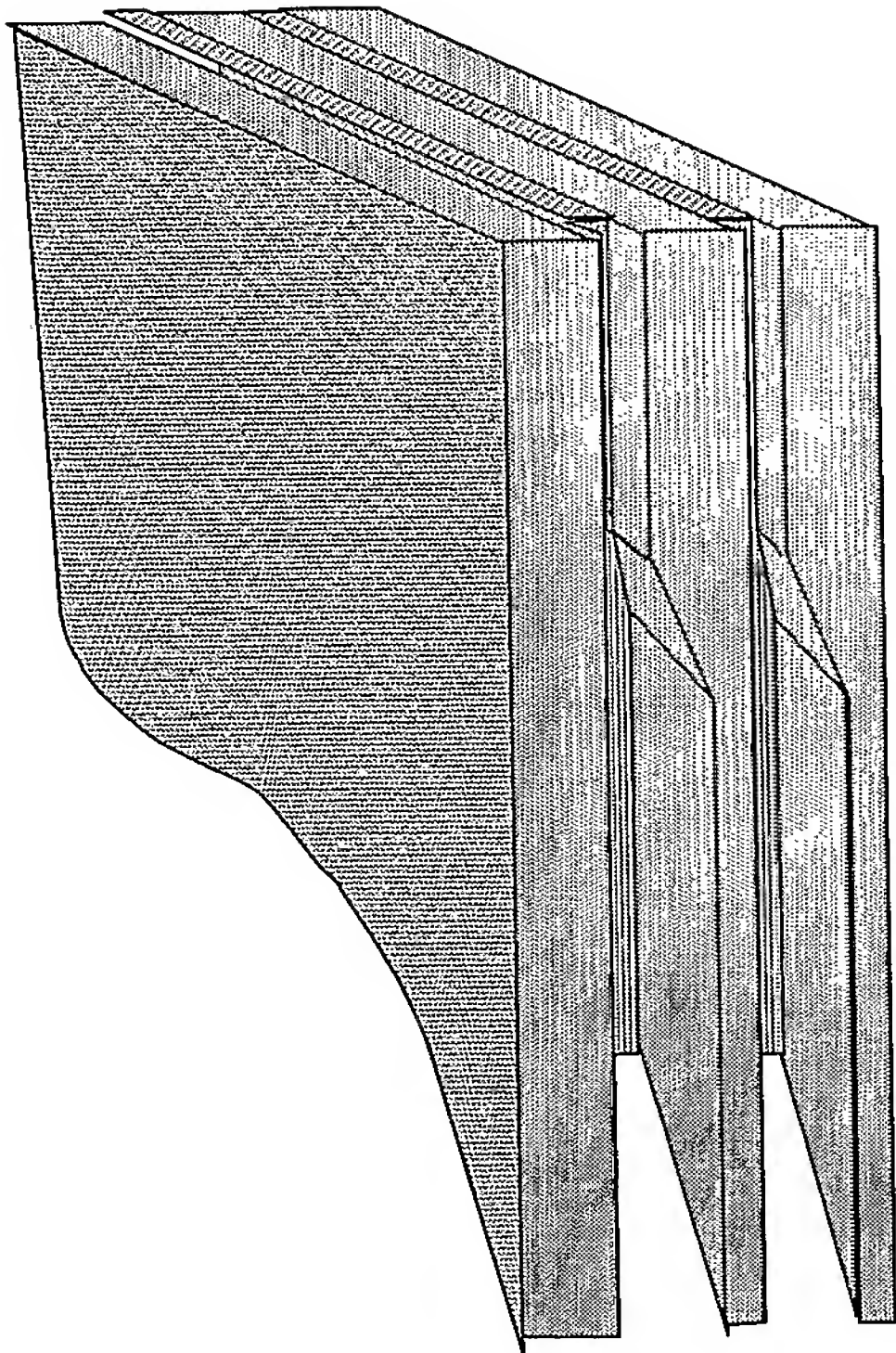


FIGURE 54A

.....

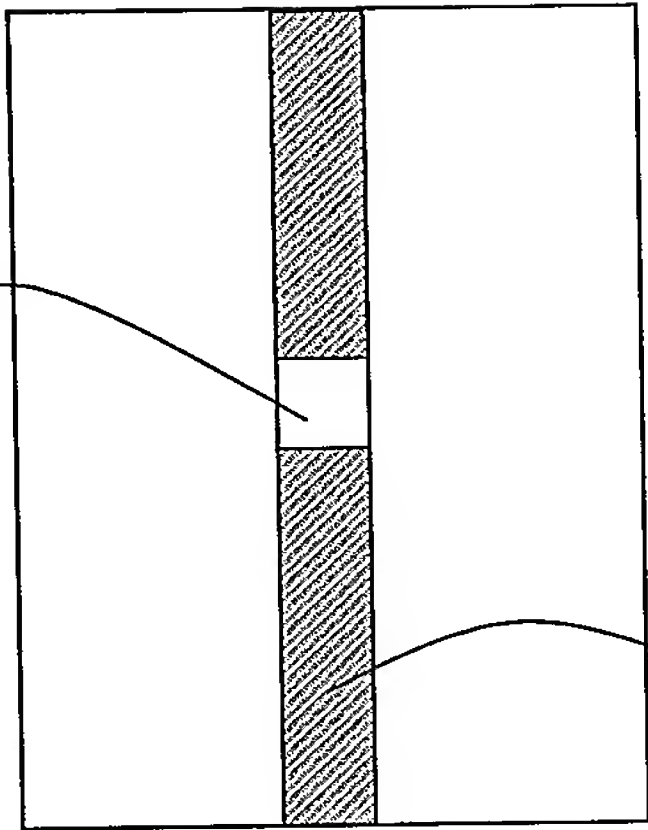


FIGURE 54B

38

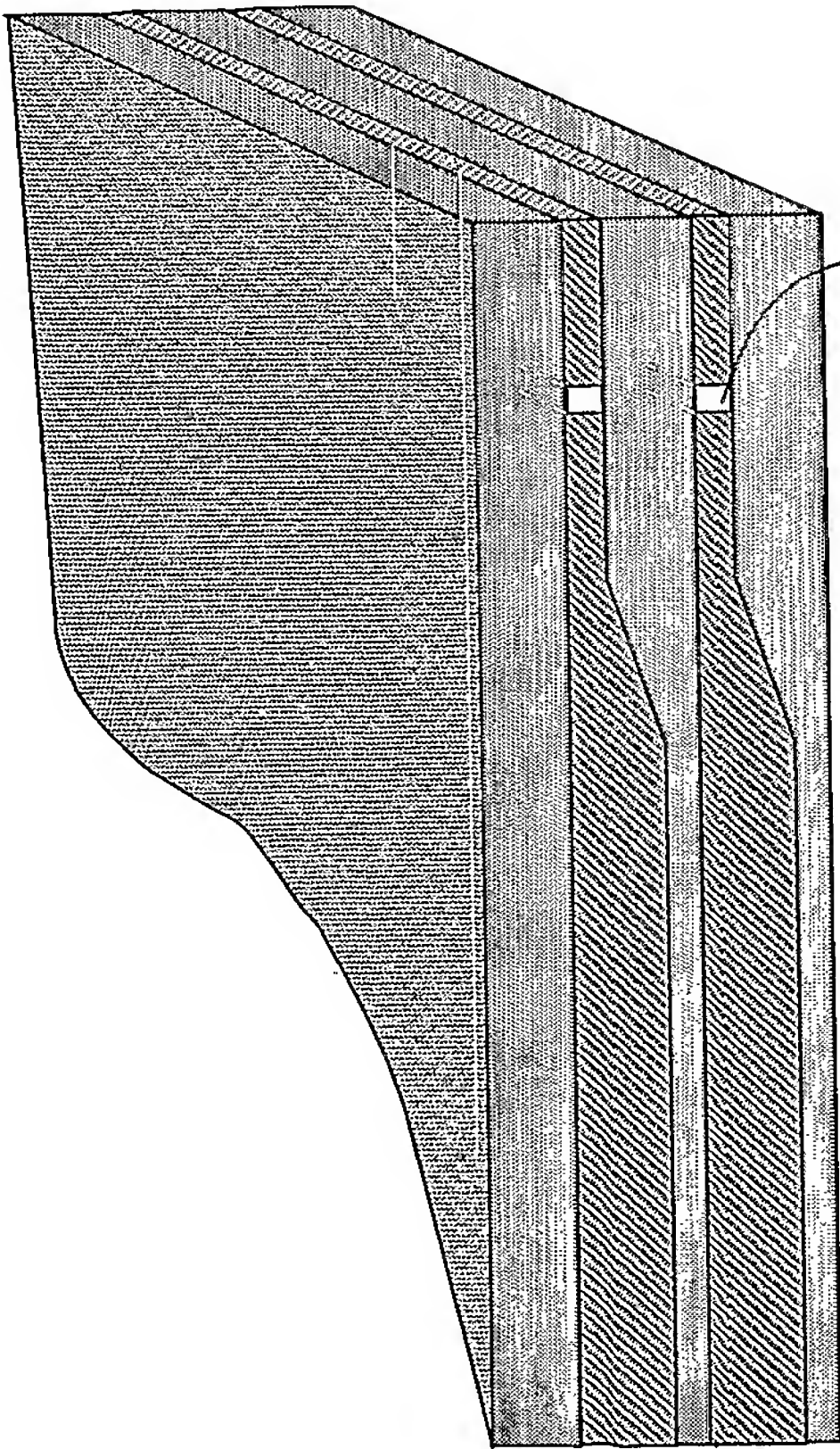
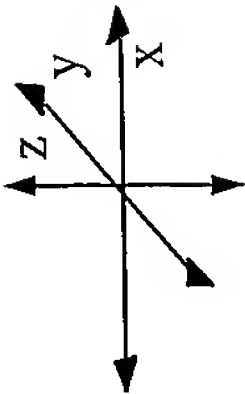
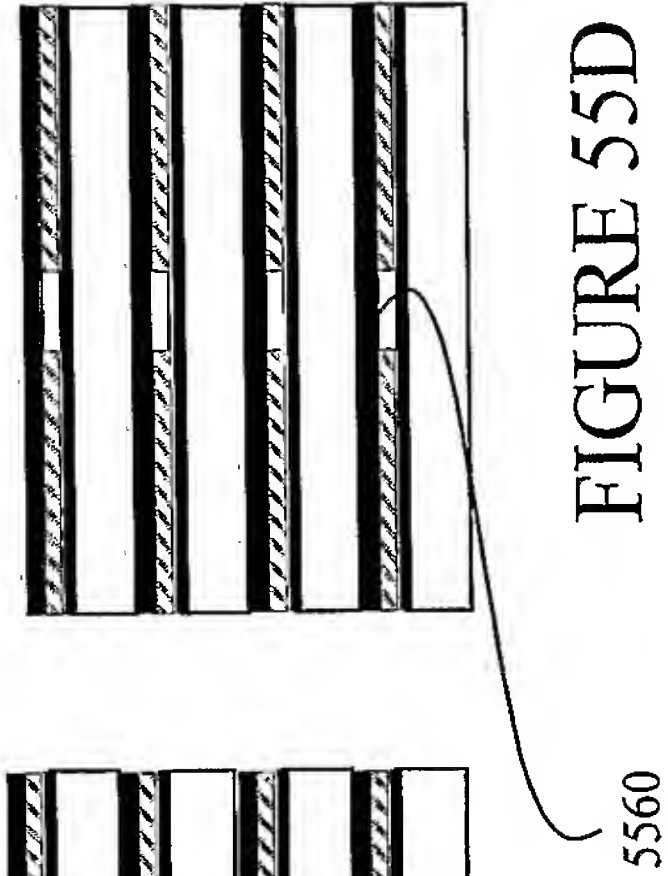
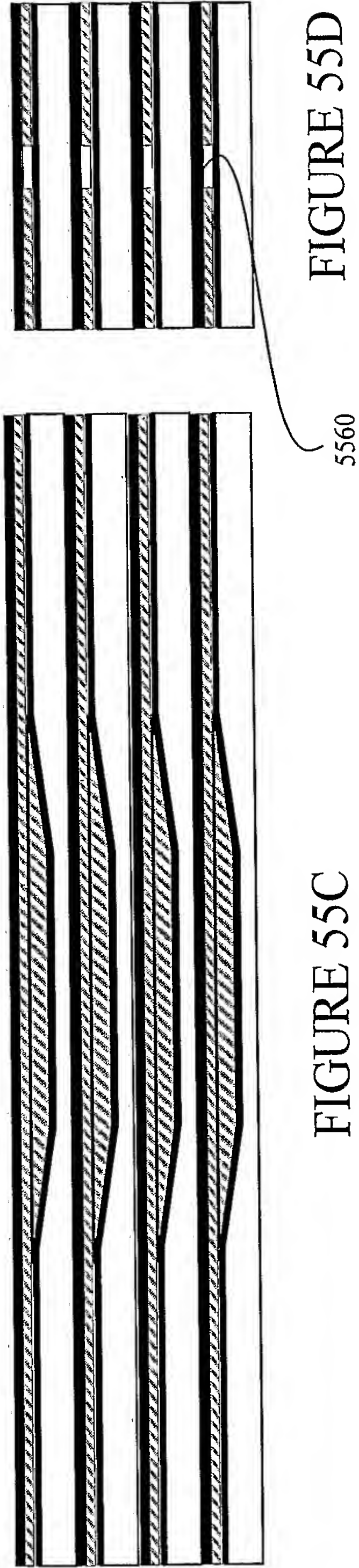
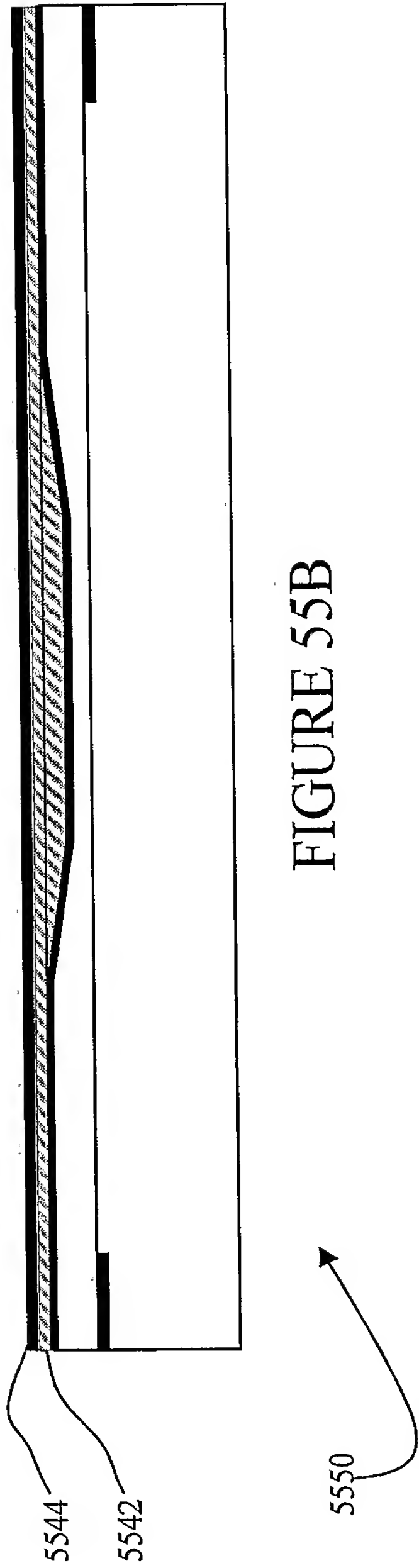
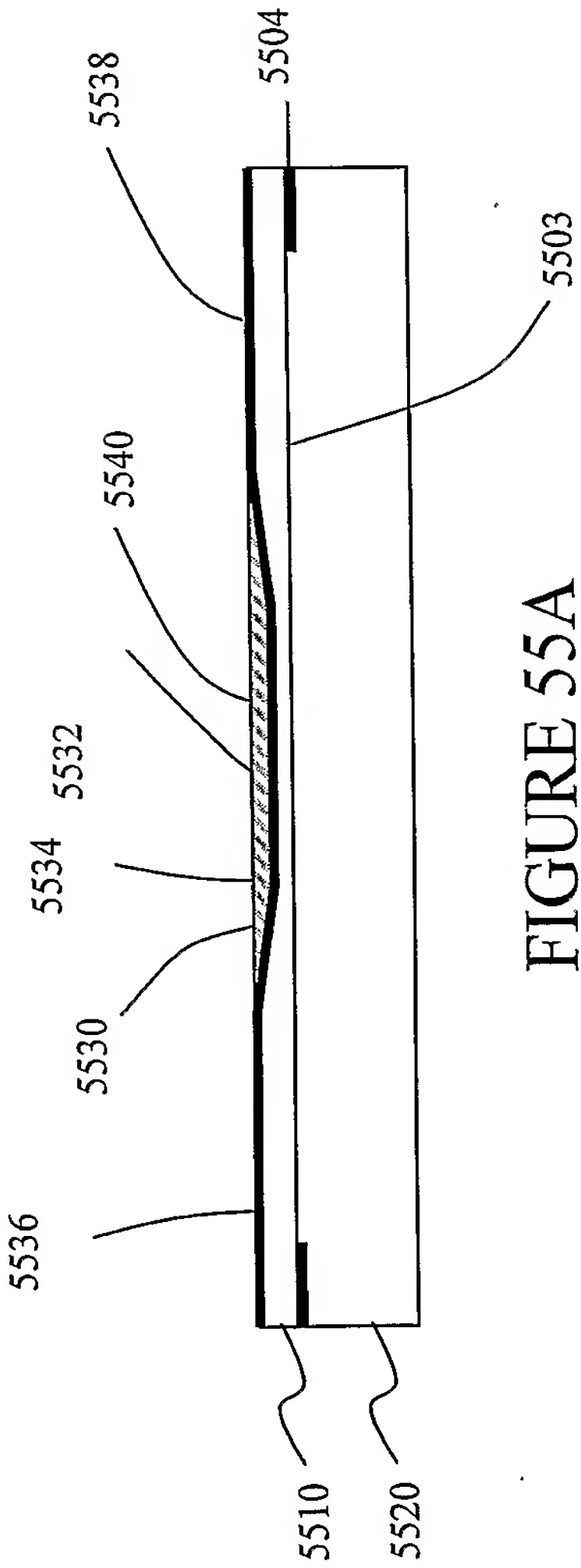


FIGURE 53

.....

{MP16}86



A_A		
A_L	A_C	A_R
N_L	<u>5602</u>	N_R
B_L	B_C	B_R
B_B		

FIGURE 56

5600



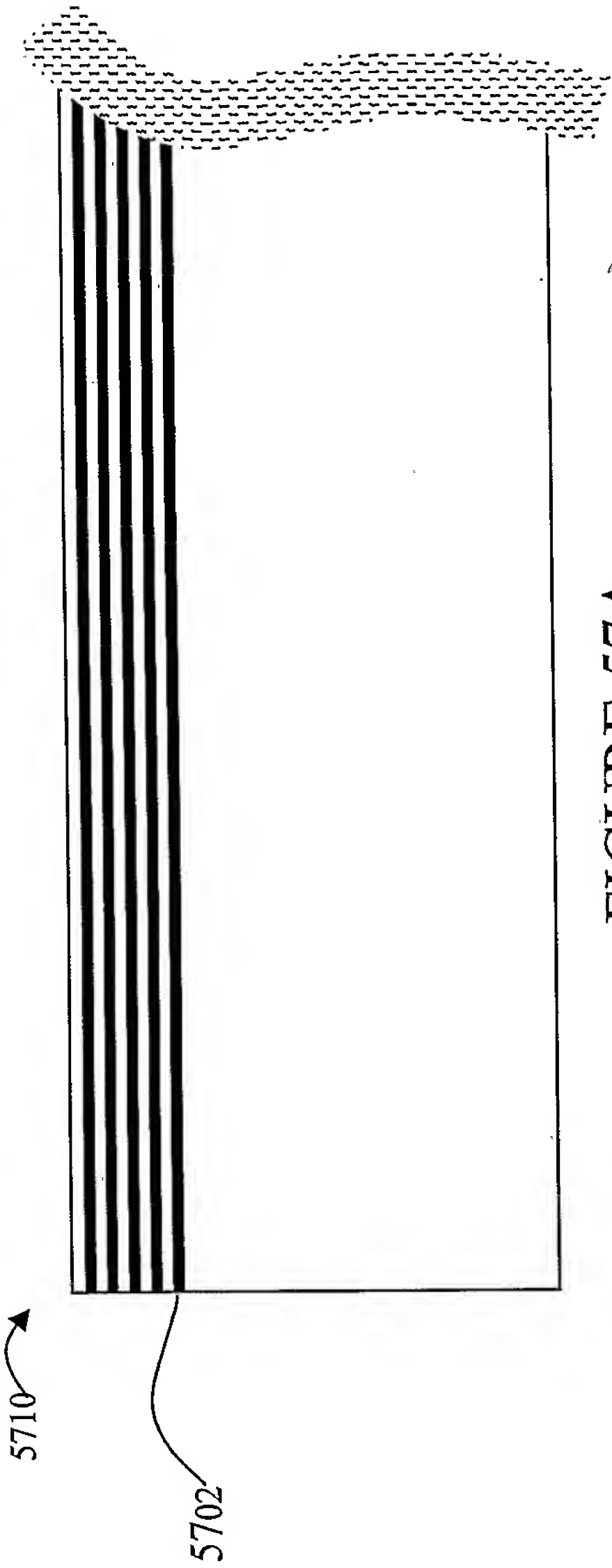


FIGURE 57A

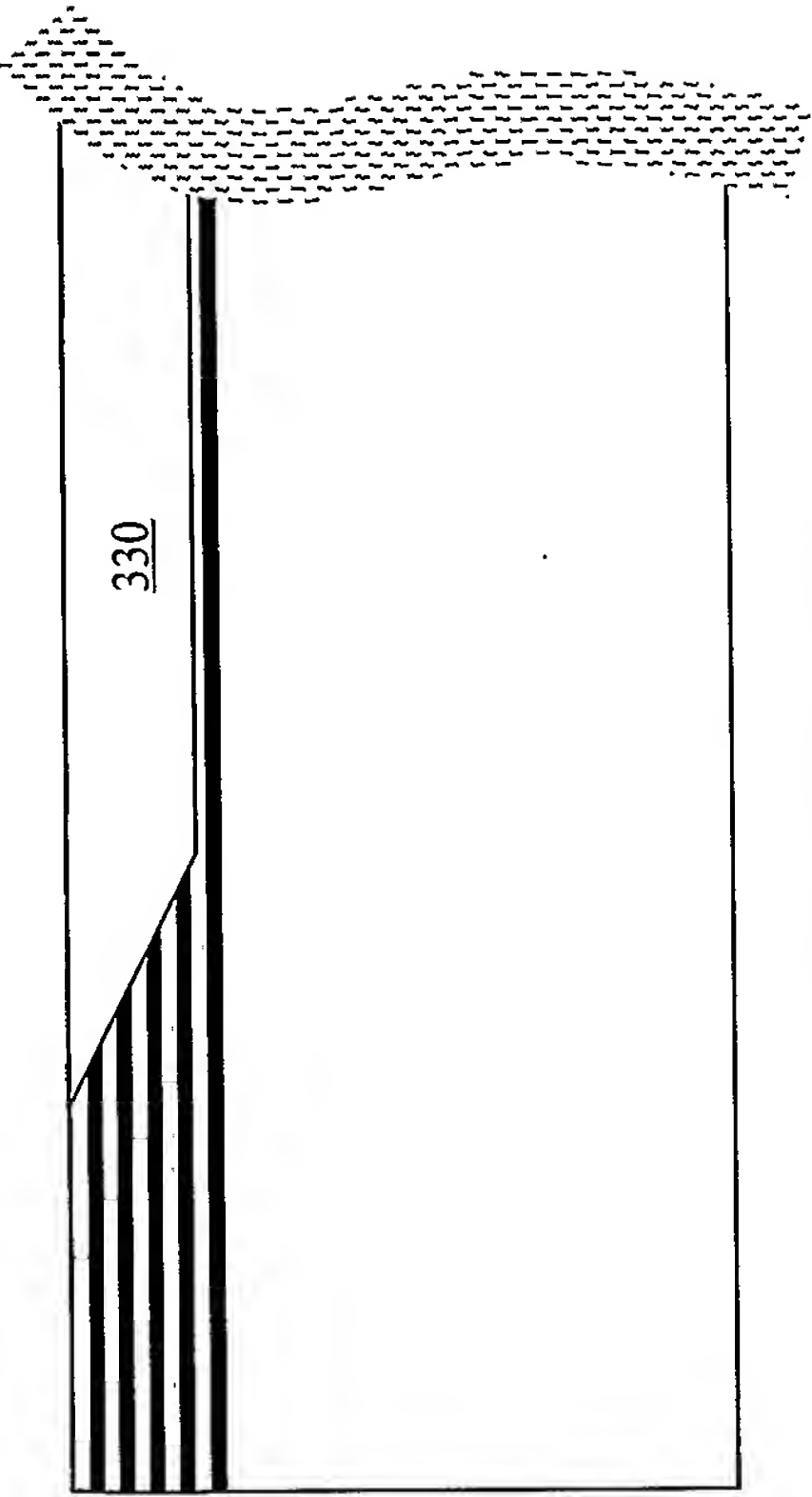


FIGURE 57B

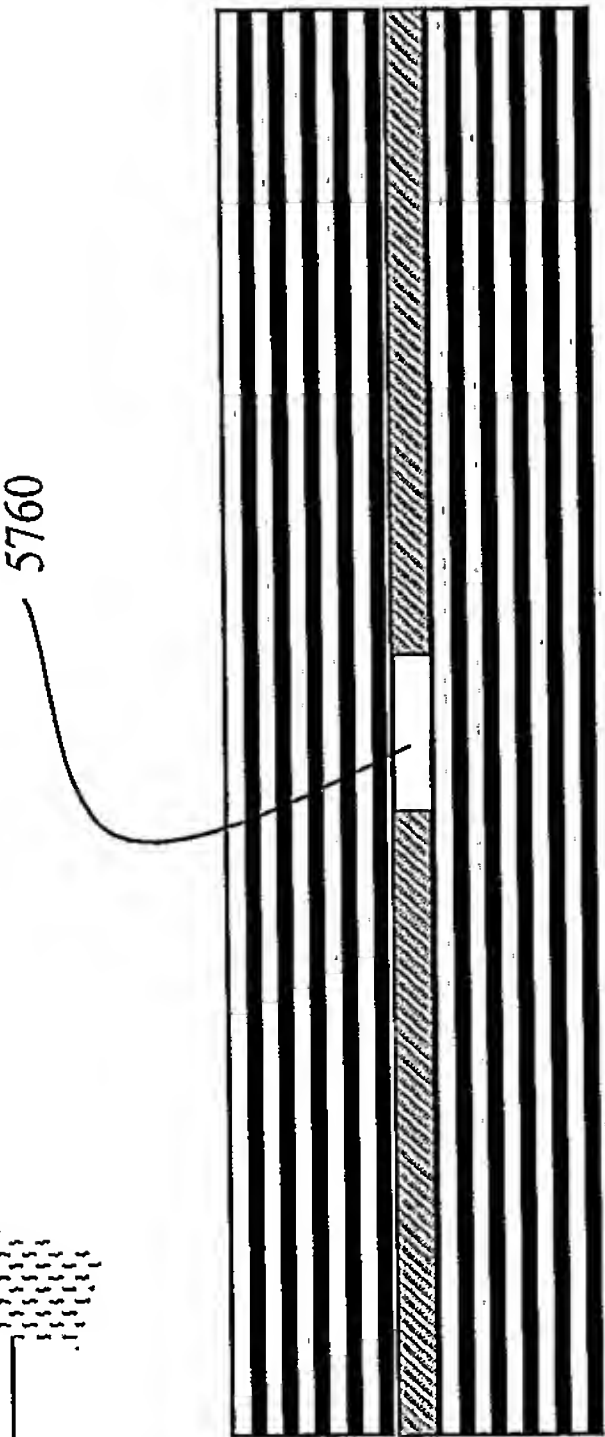
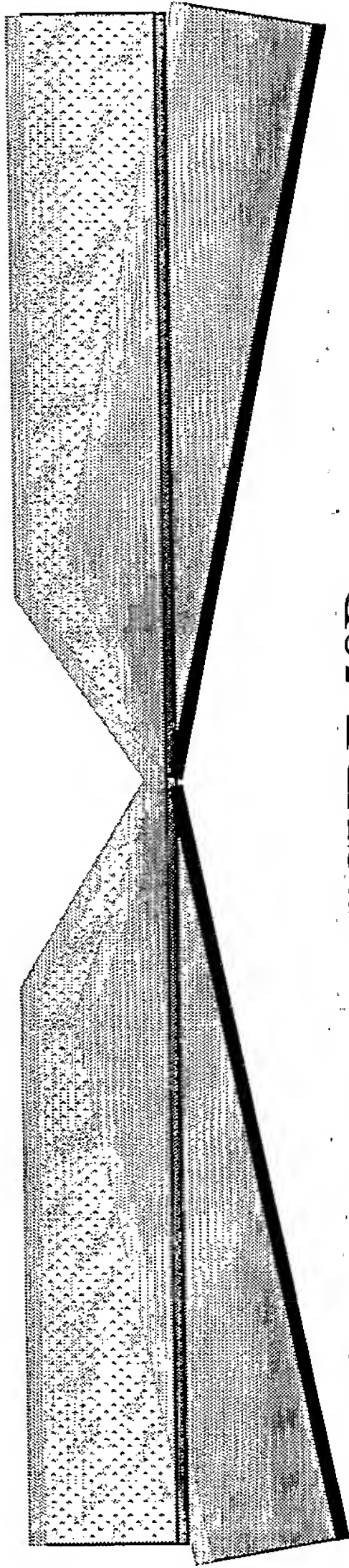
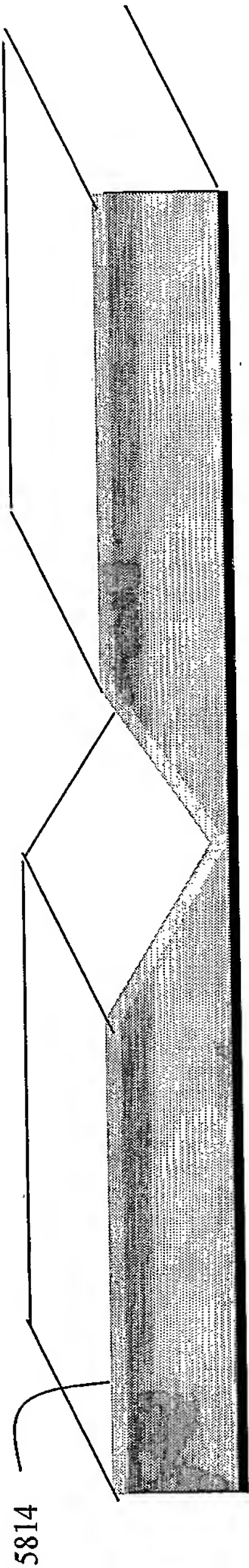
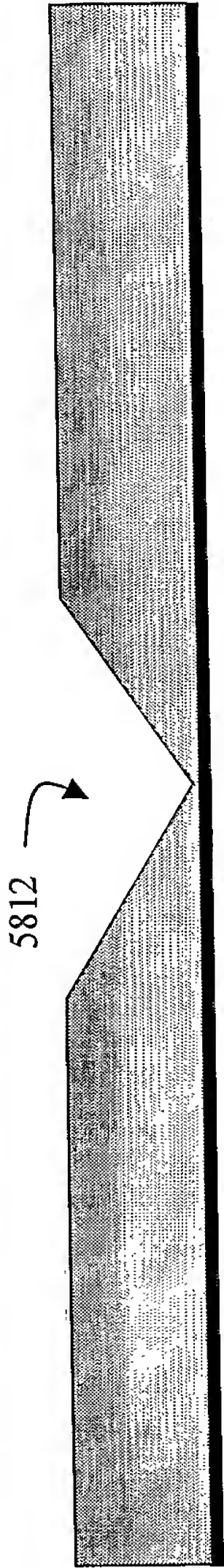
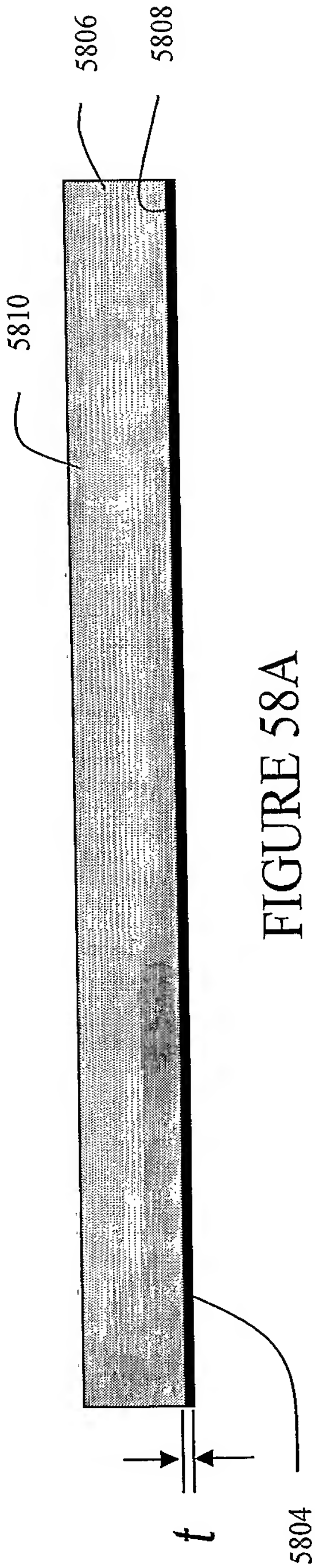
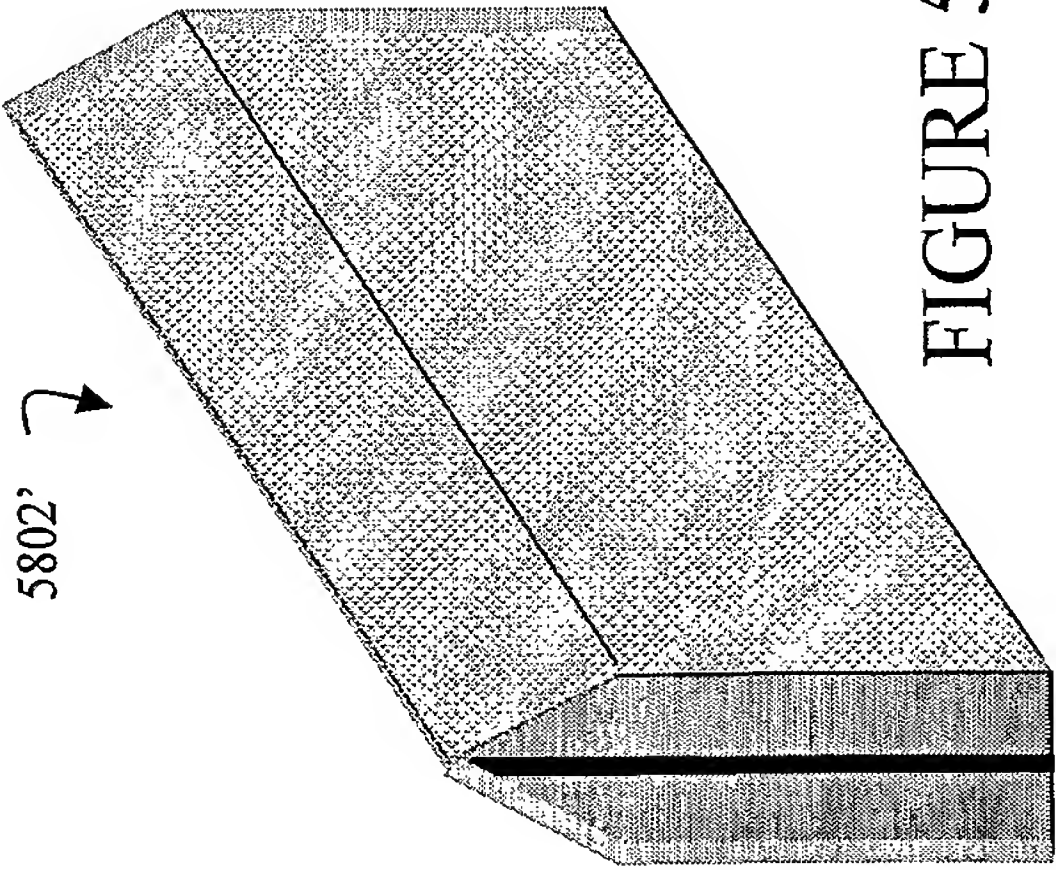
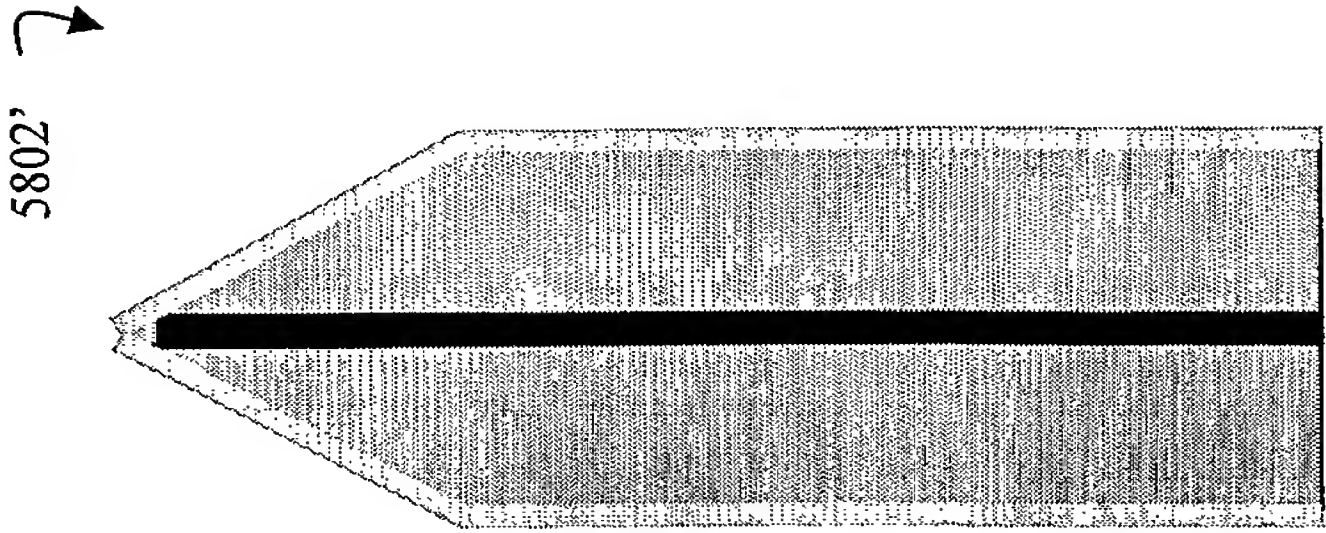


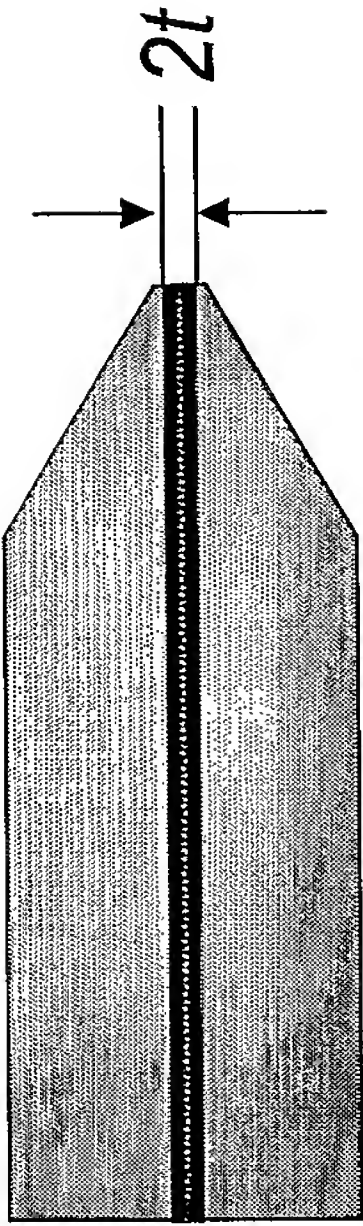
FIGURE 57C





5802 ↷

FIGURE 59A



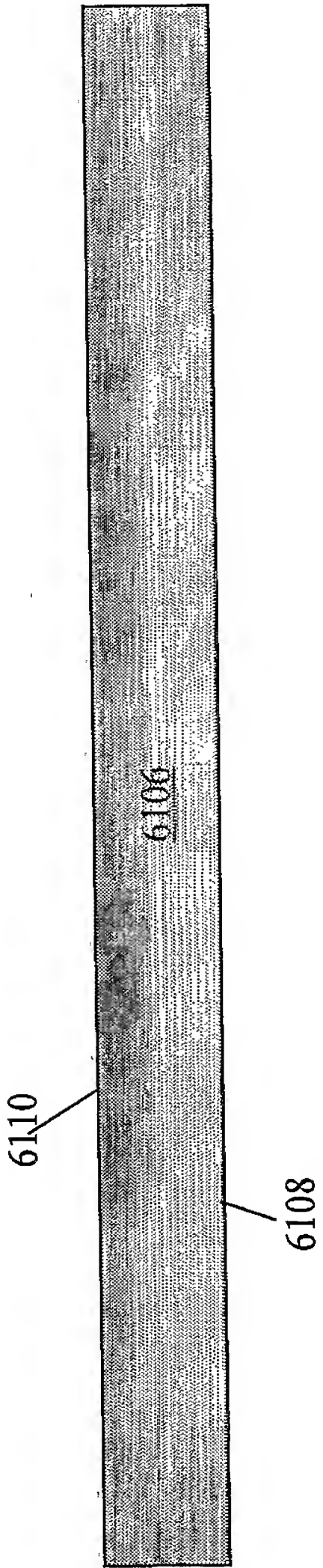


FIGURE 61A

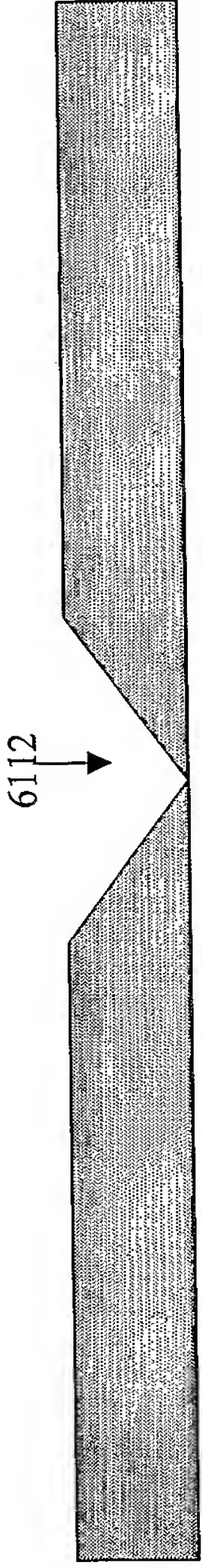


FIGURE 61B

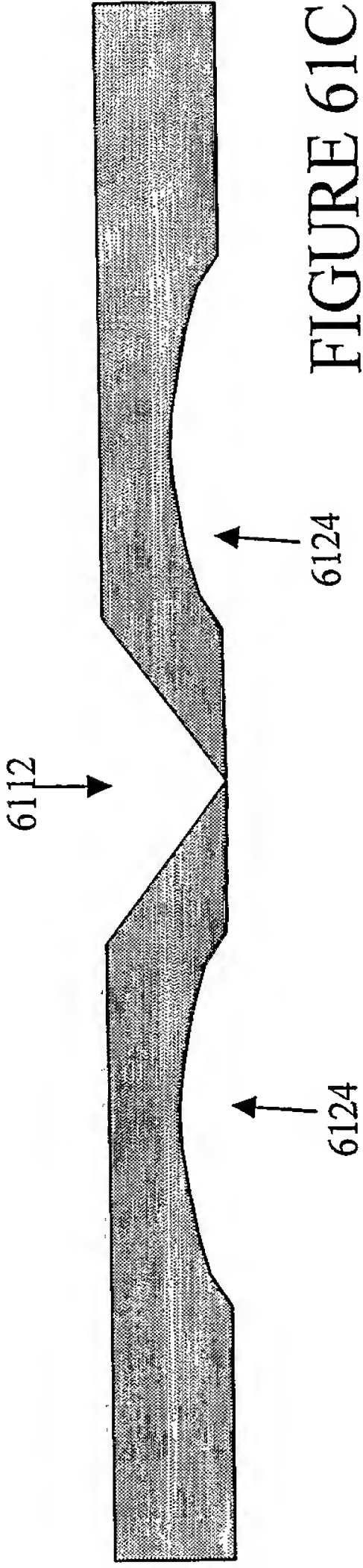


FIGURE 61C

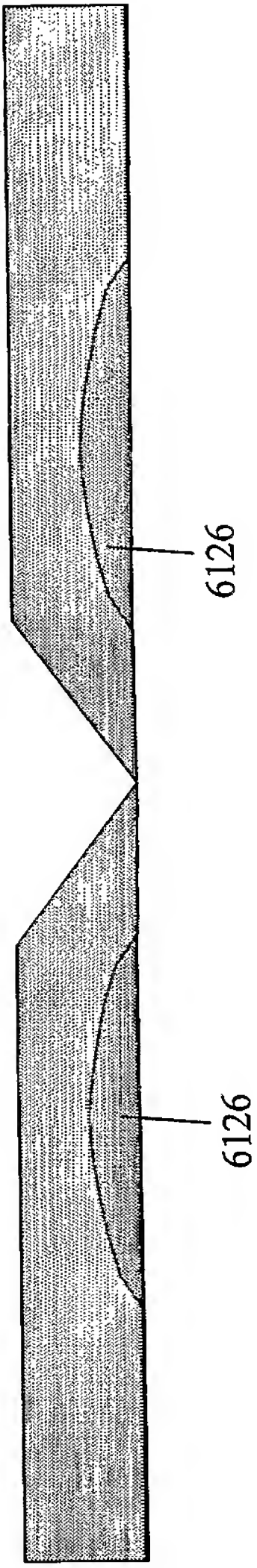


FIGURE 61D

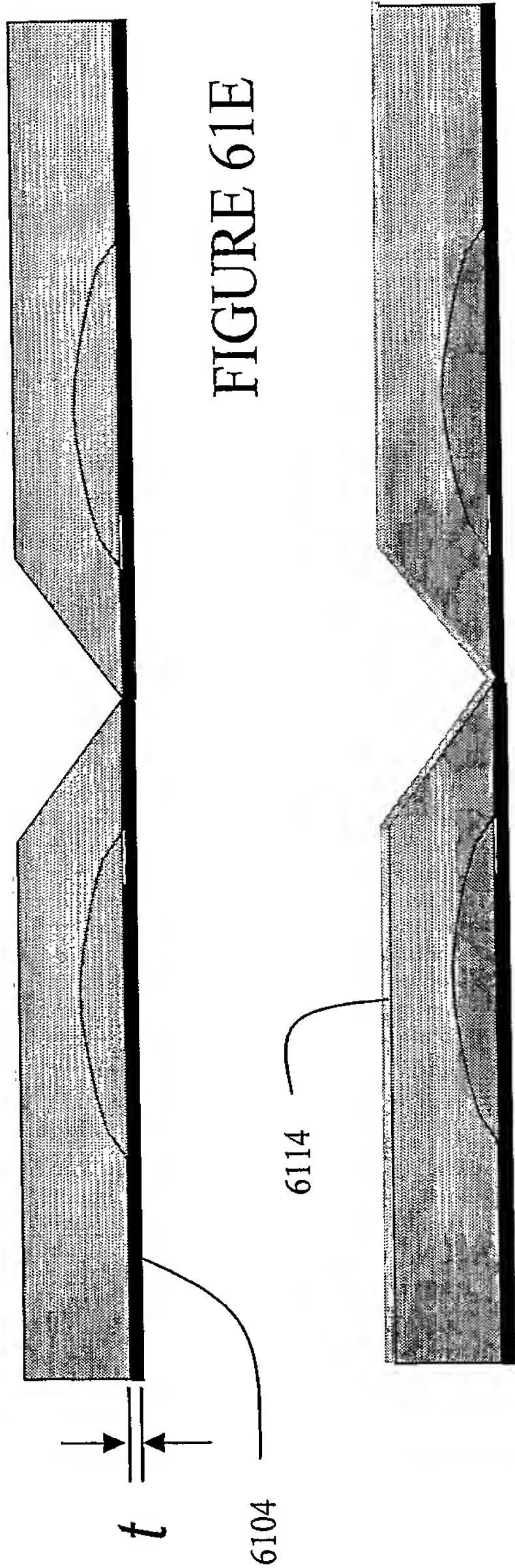


FIGURE 61E

FIGURE 61F

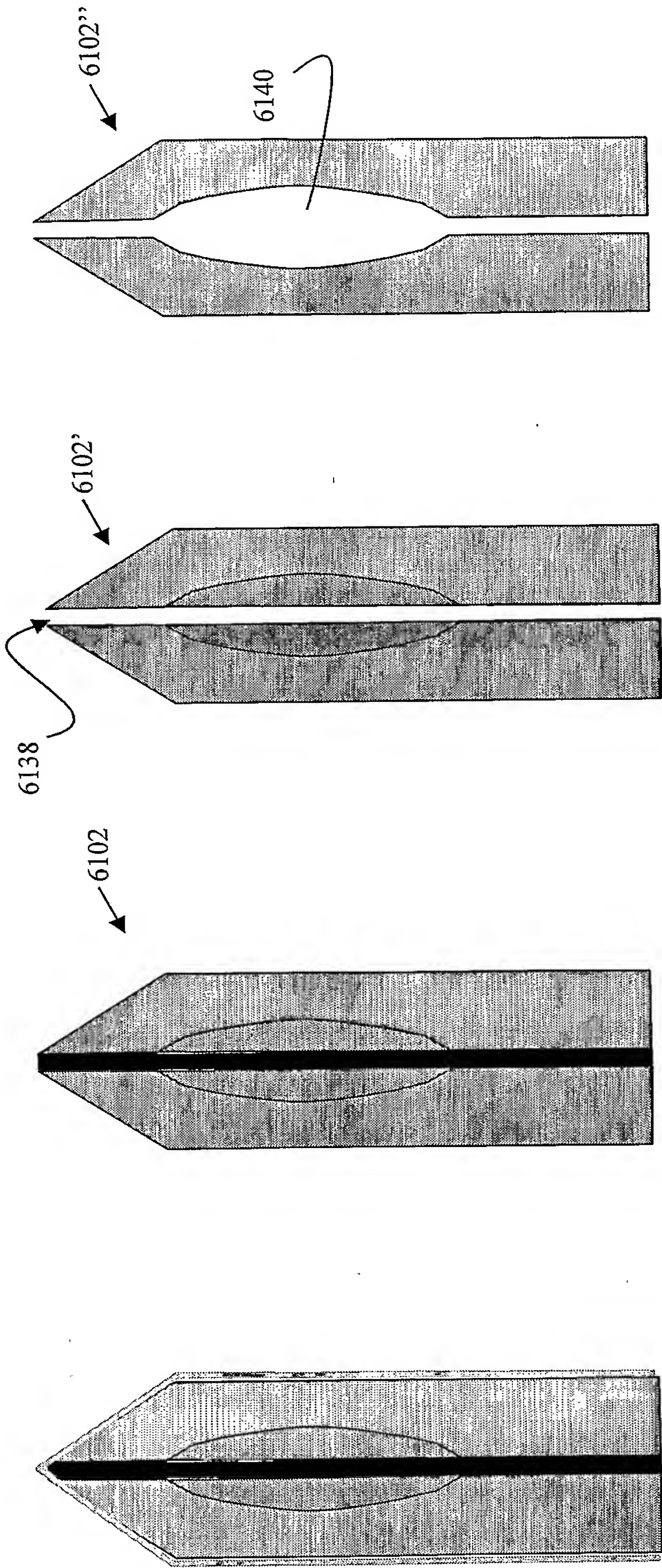


FIGURE 61G FIGURE 61H FIGURE 61I FIGURE 61J

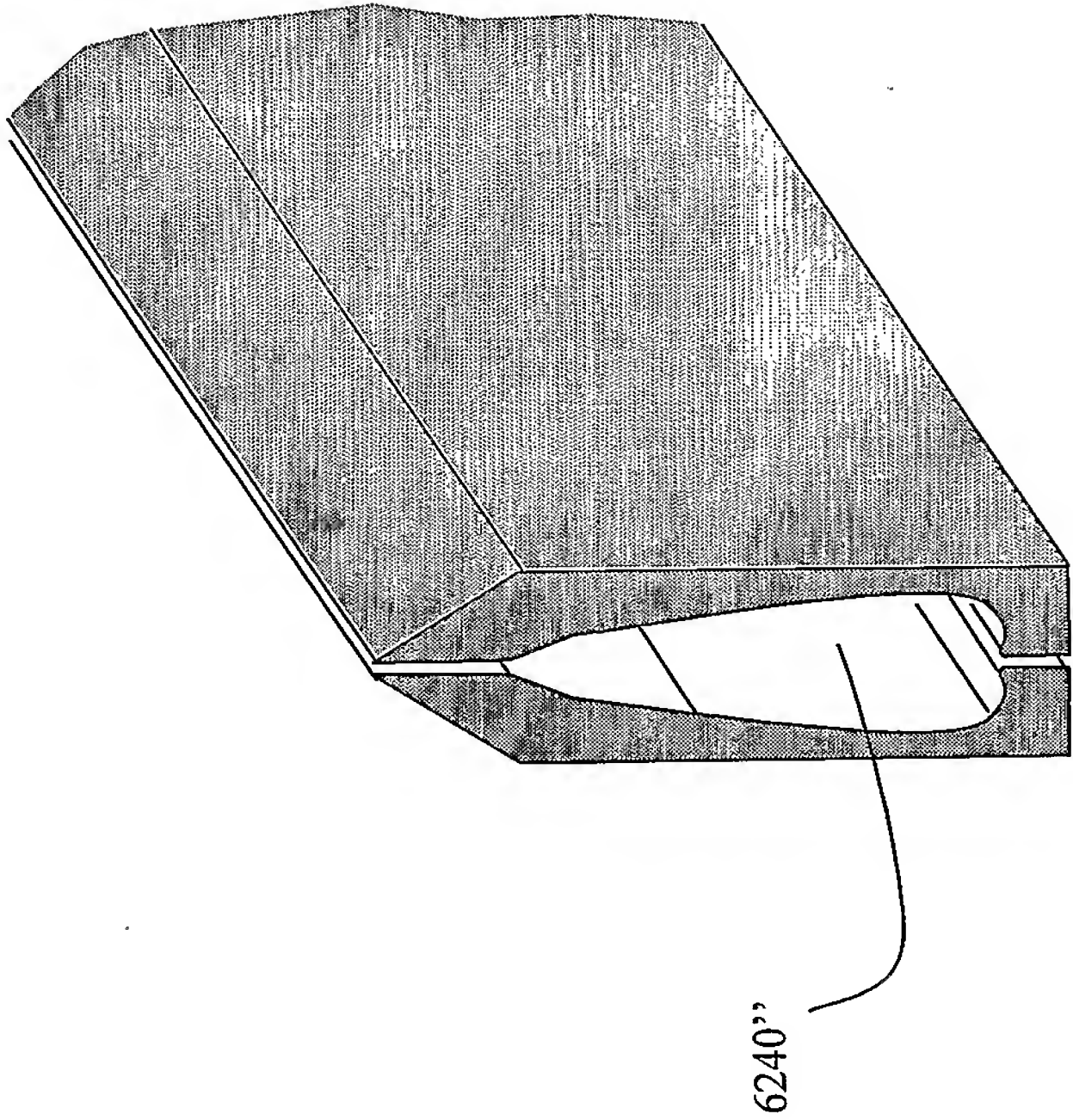


FIGURE 62A

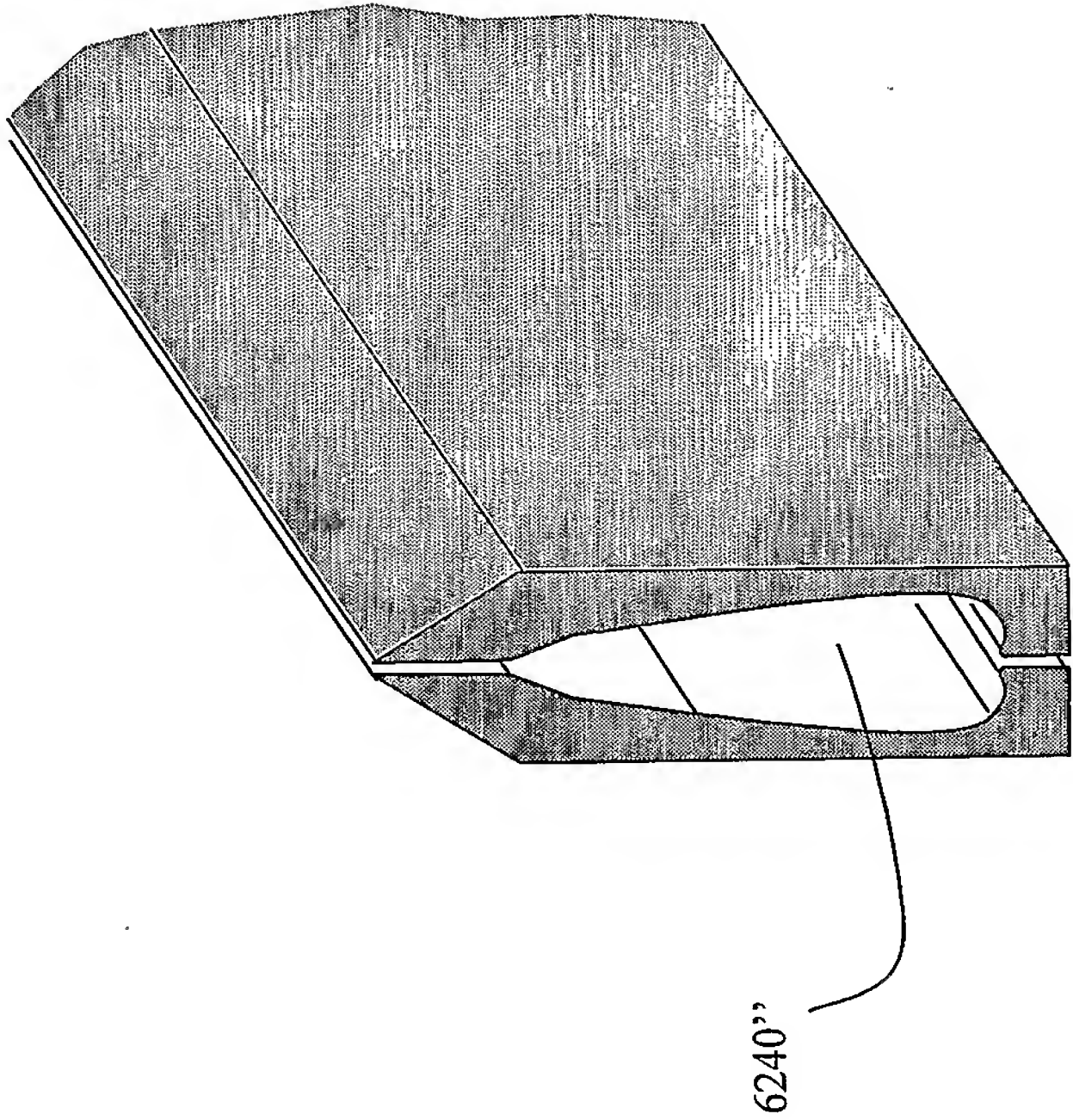
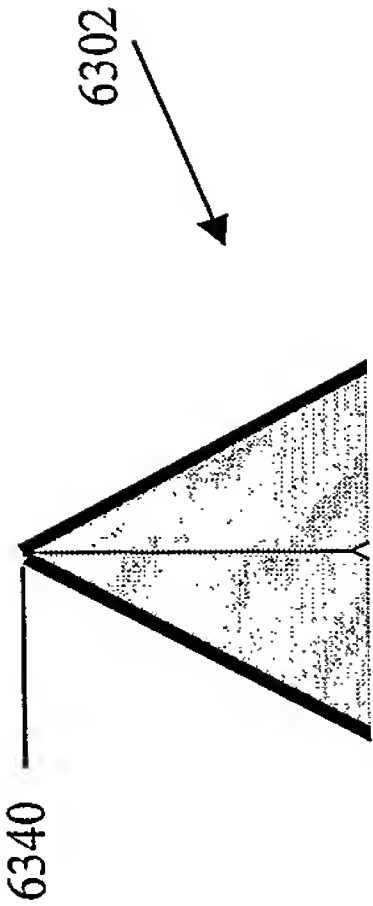
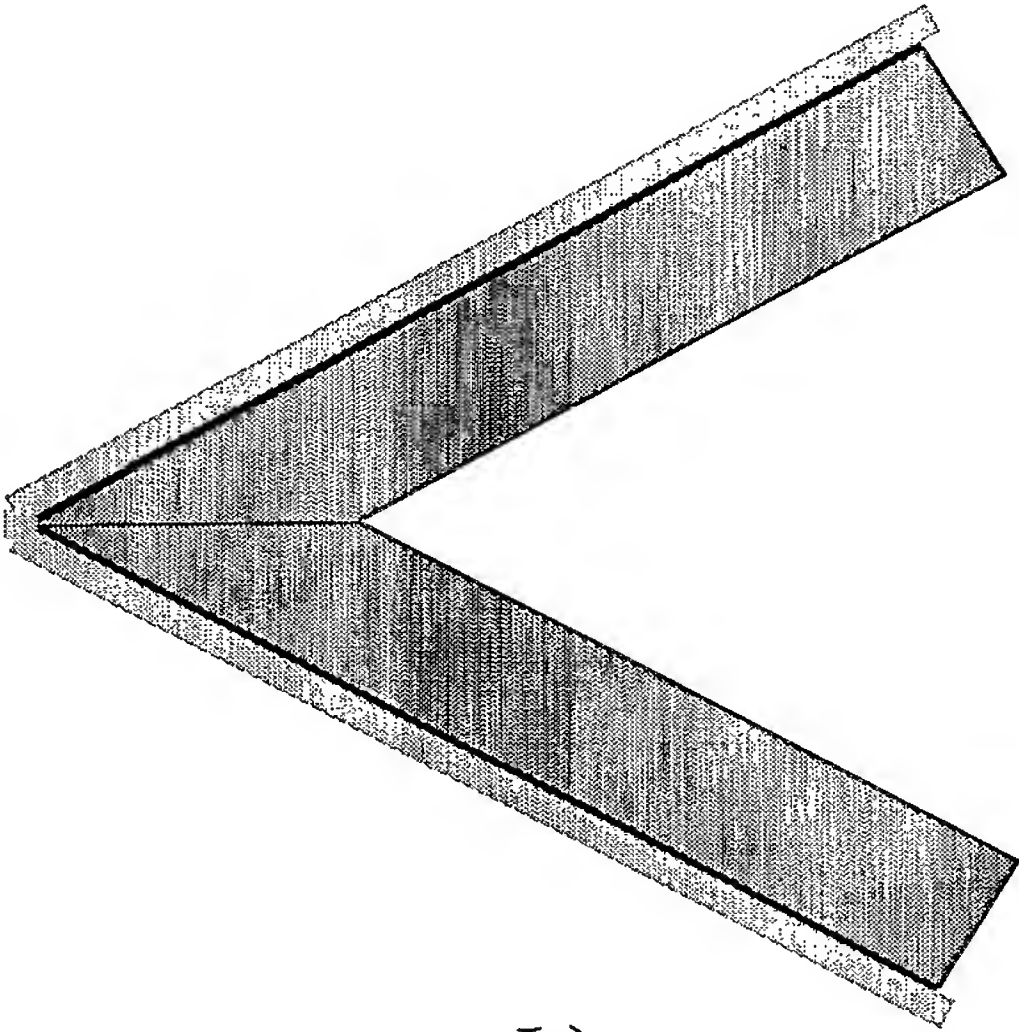
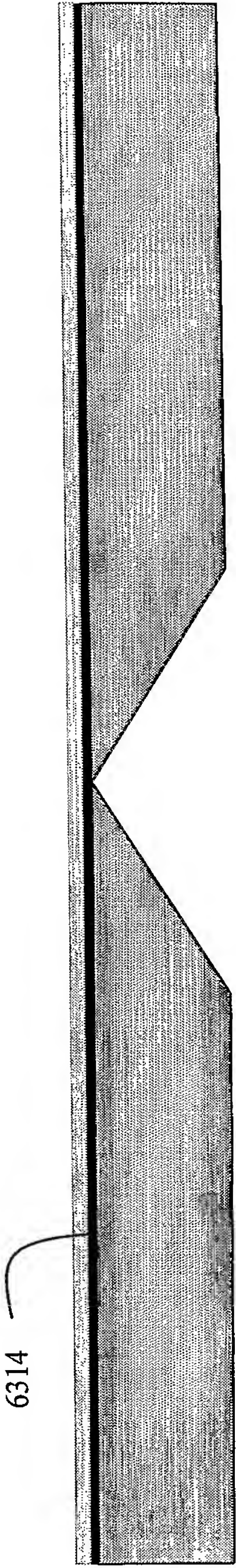
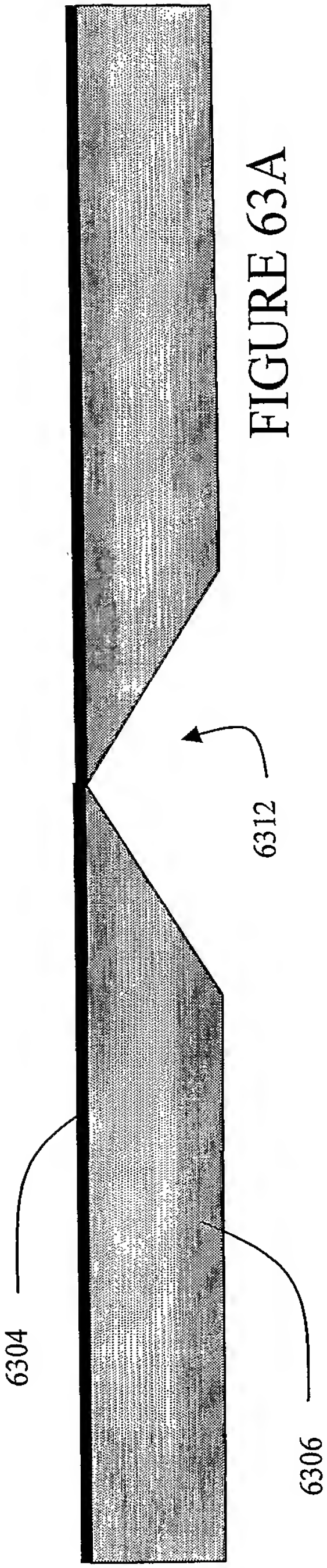


FIGURE 62B



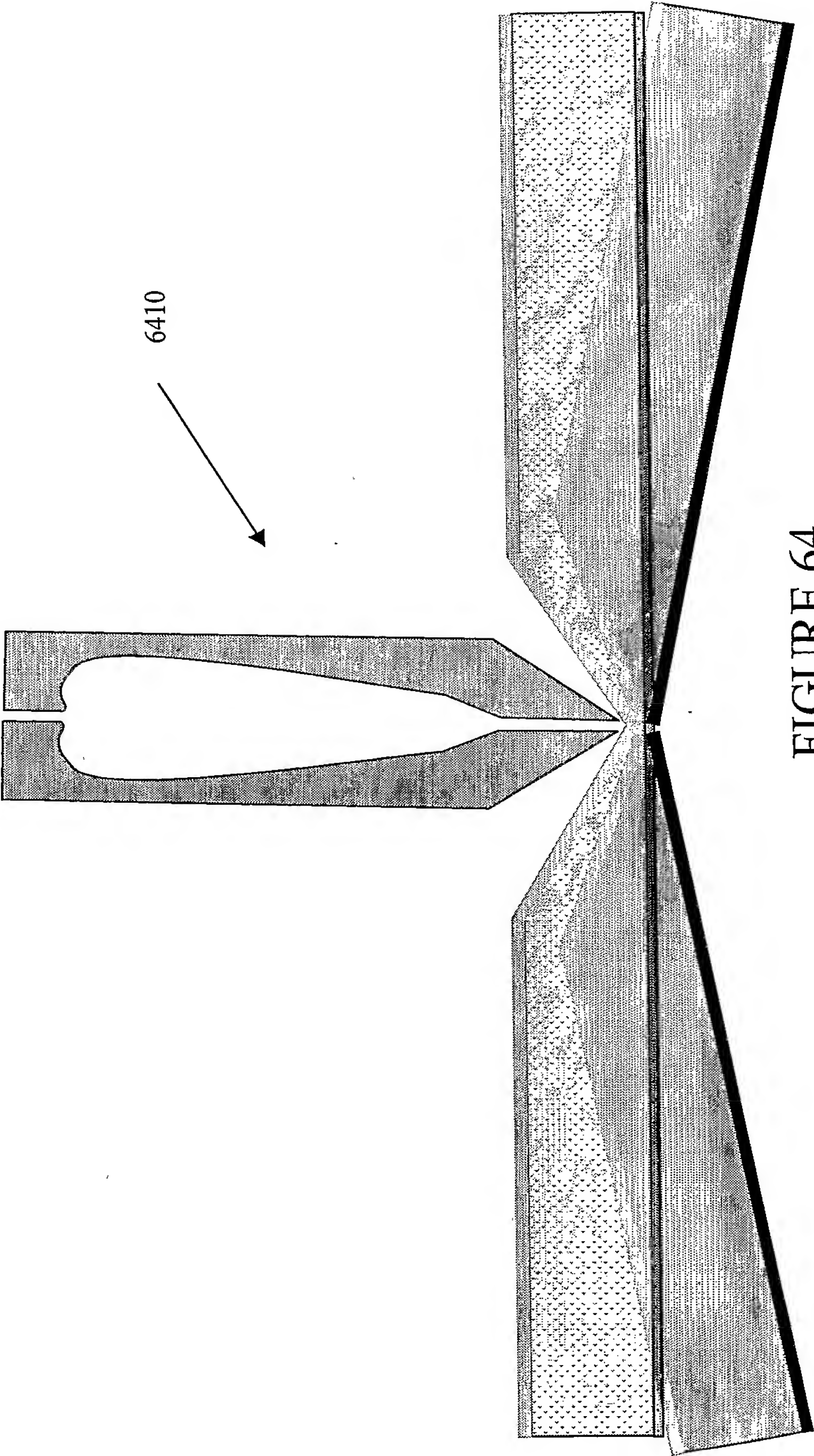
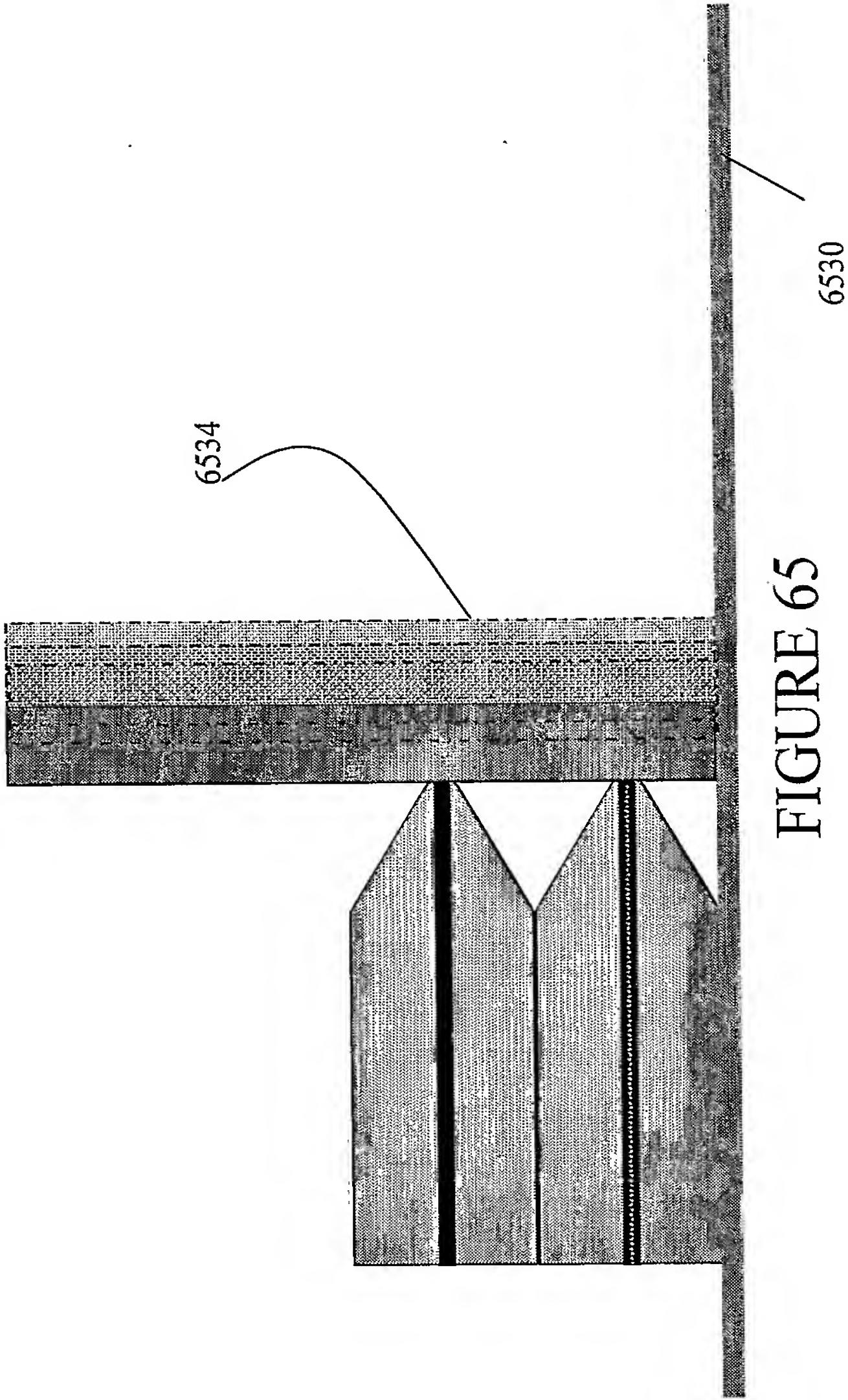
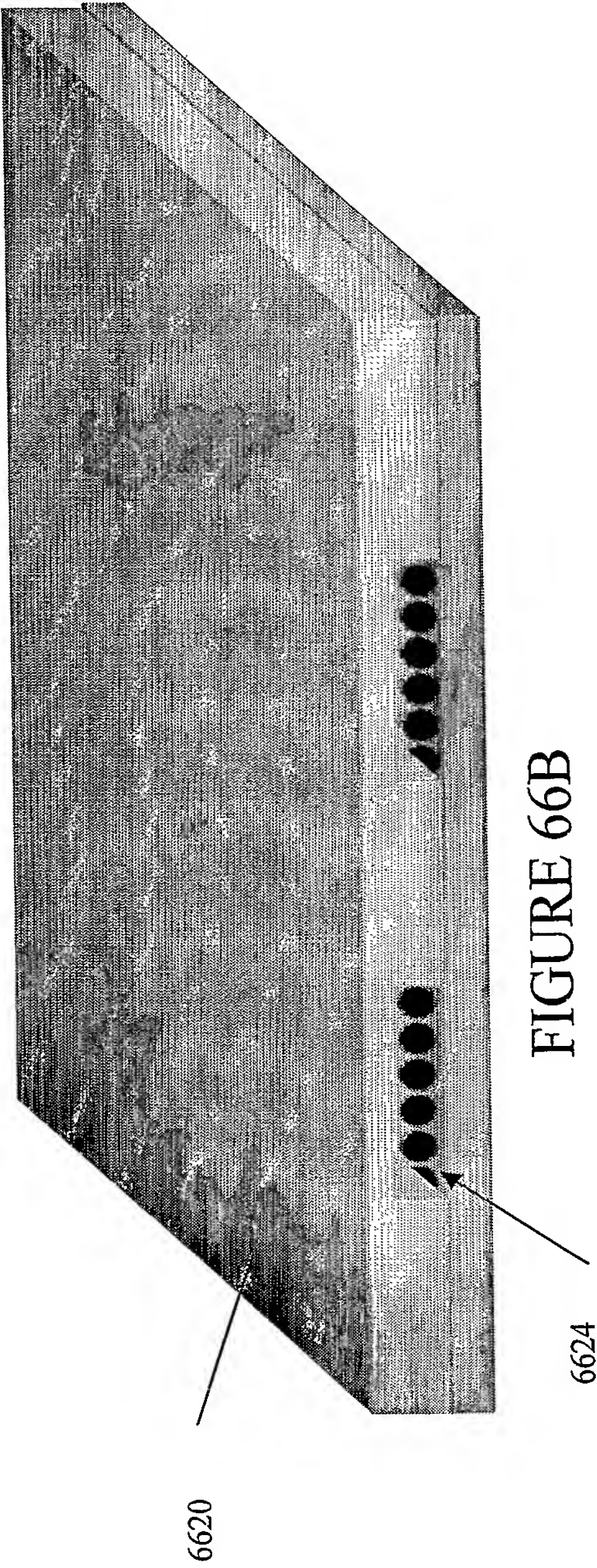
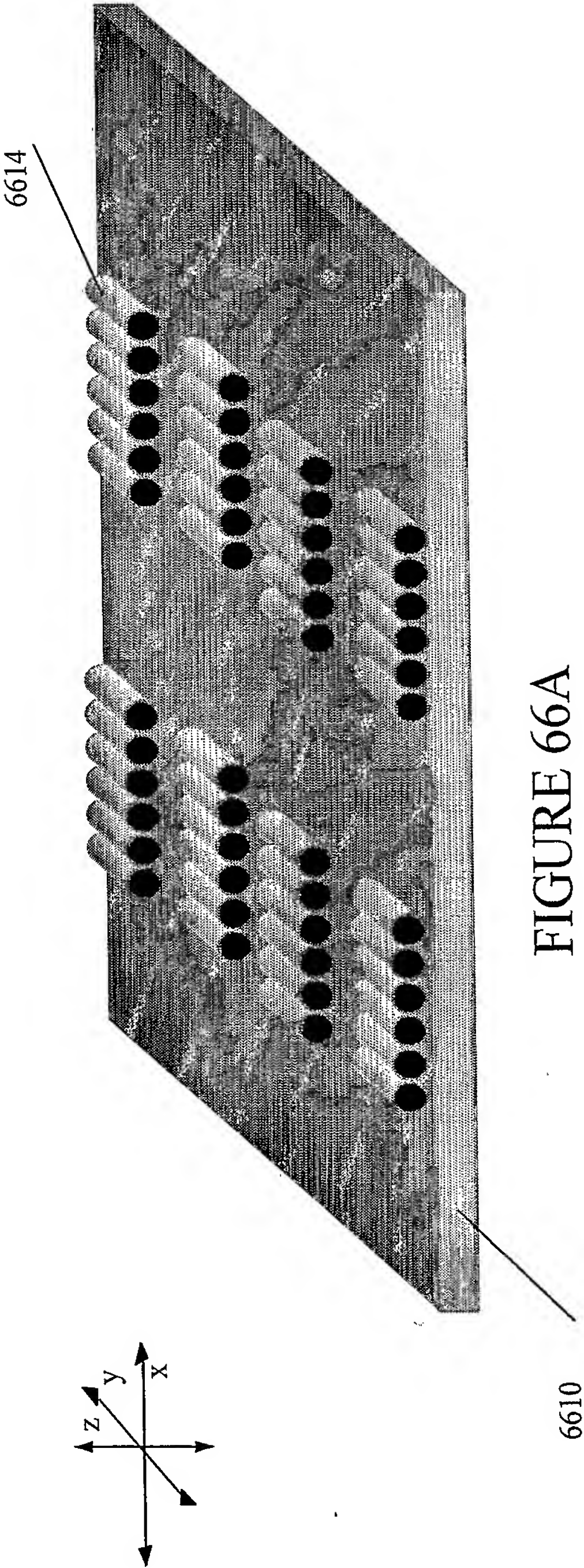


FIGURE 64





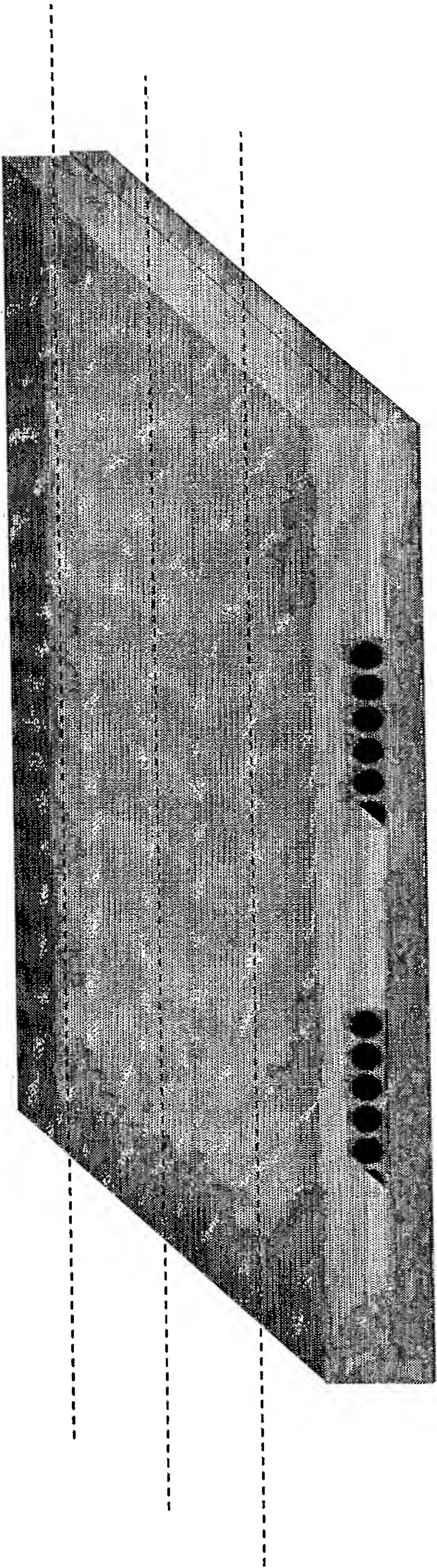


FIGURE 66C

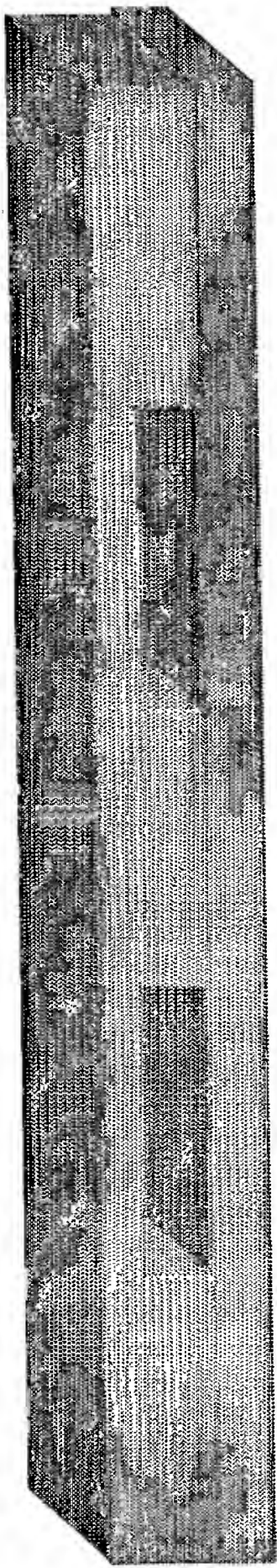
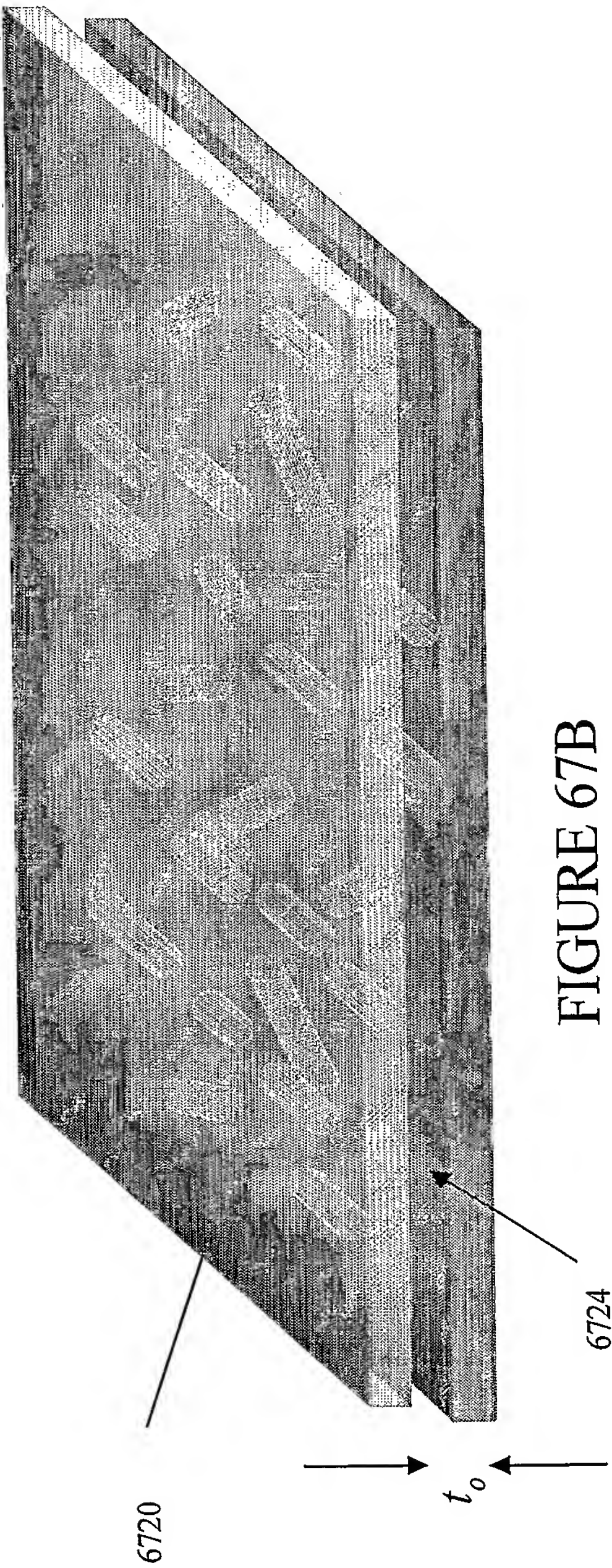
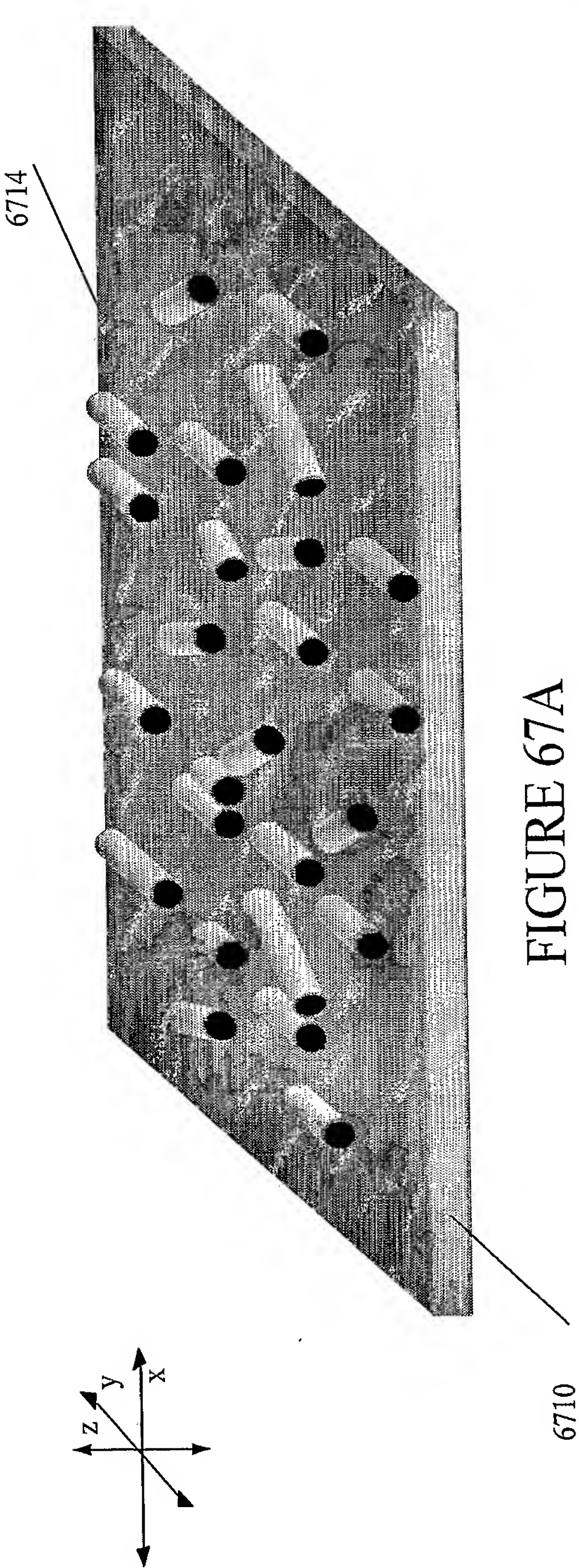


FIGURE 66D



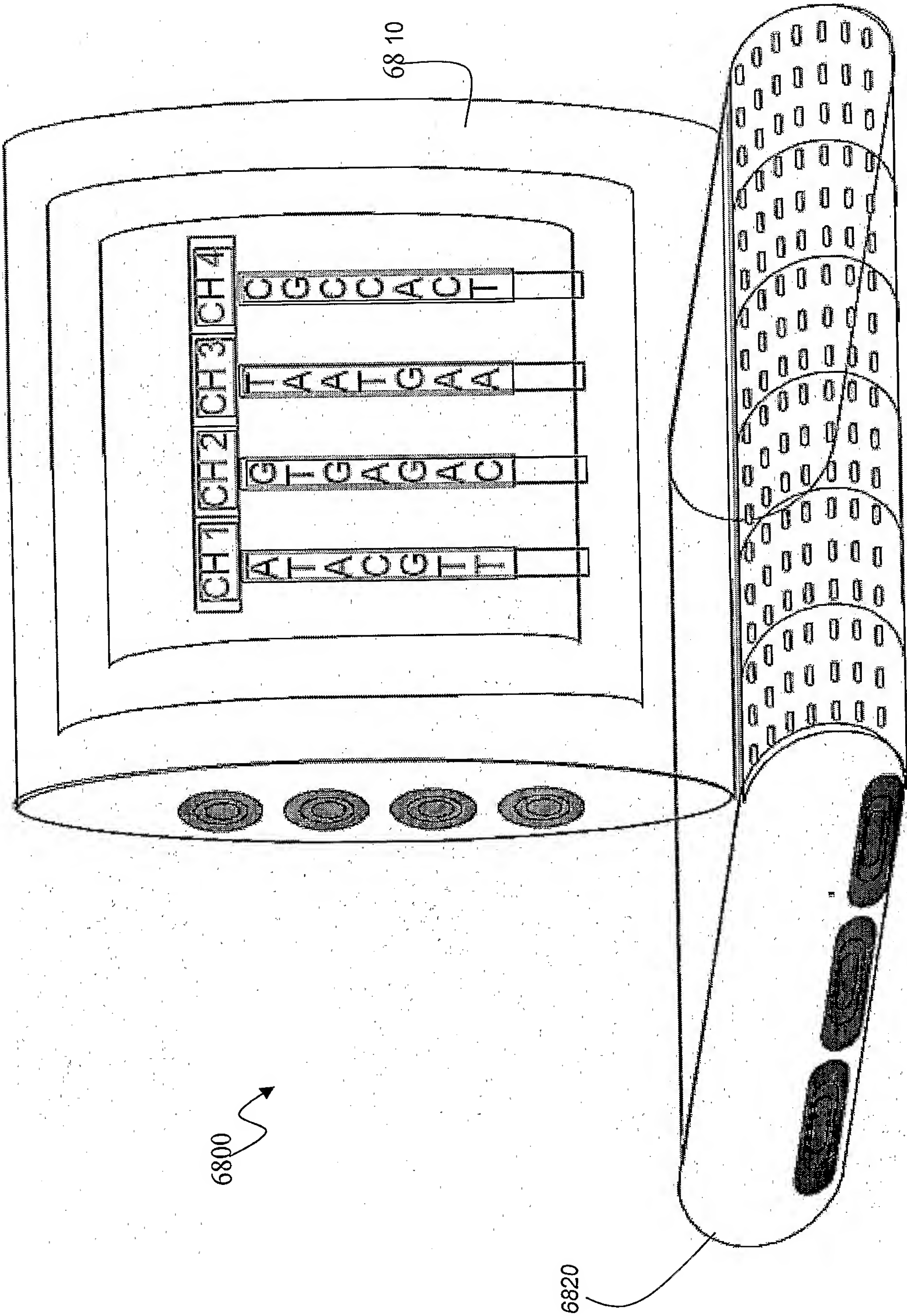


FIGURE 68

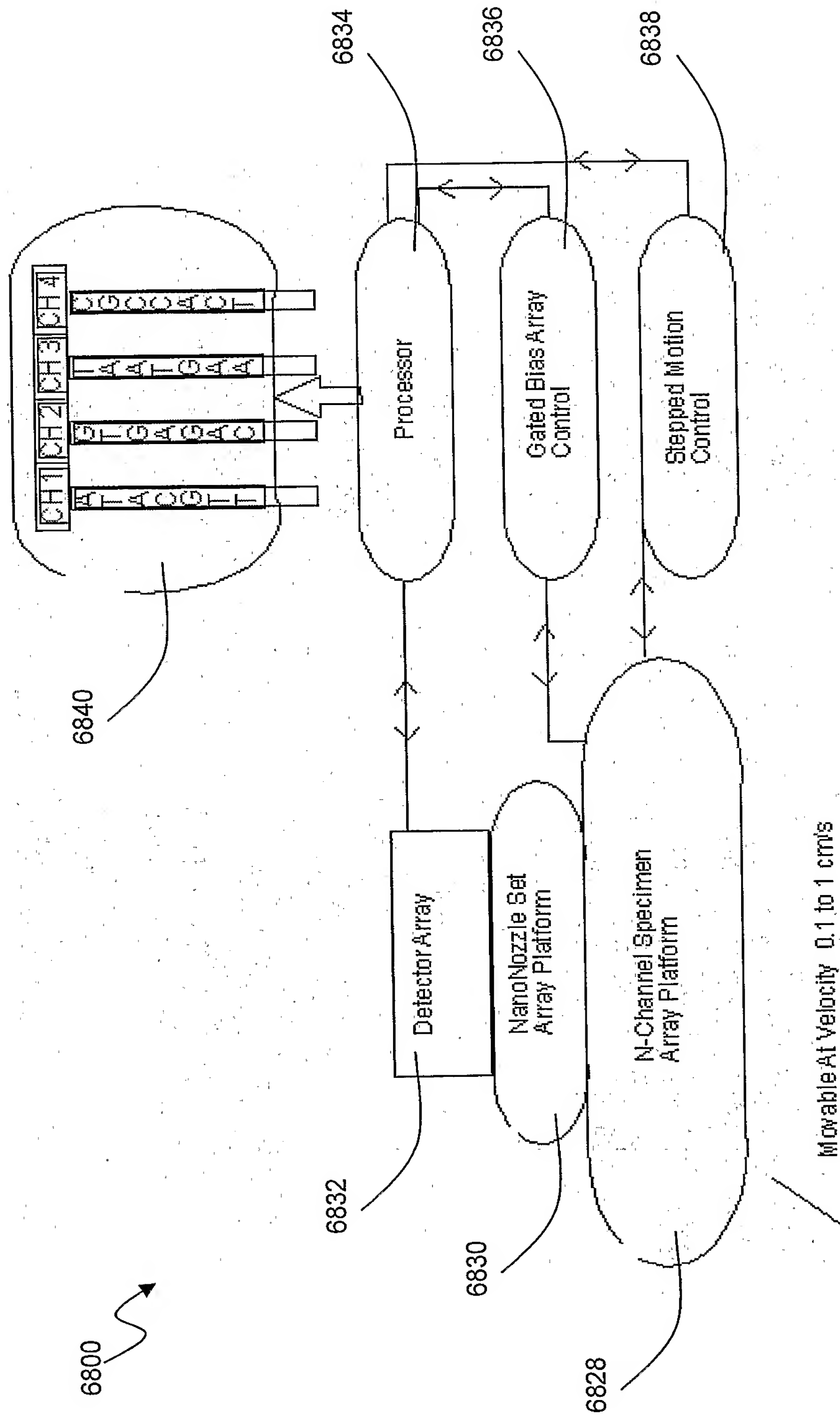


FIGURE 69

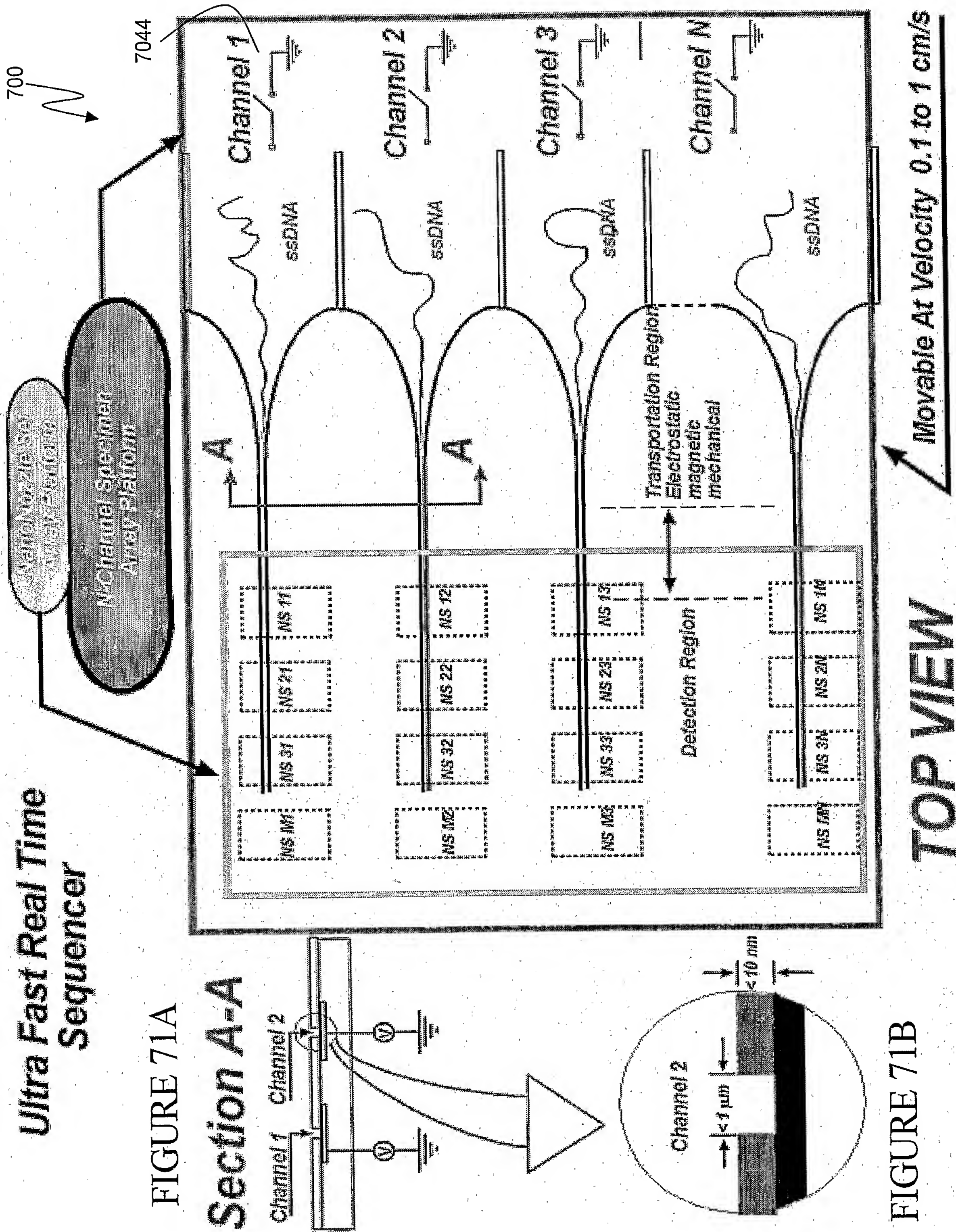


FIGURE 70

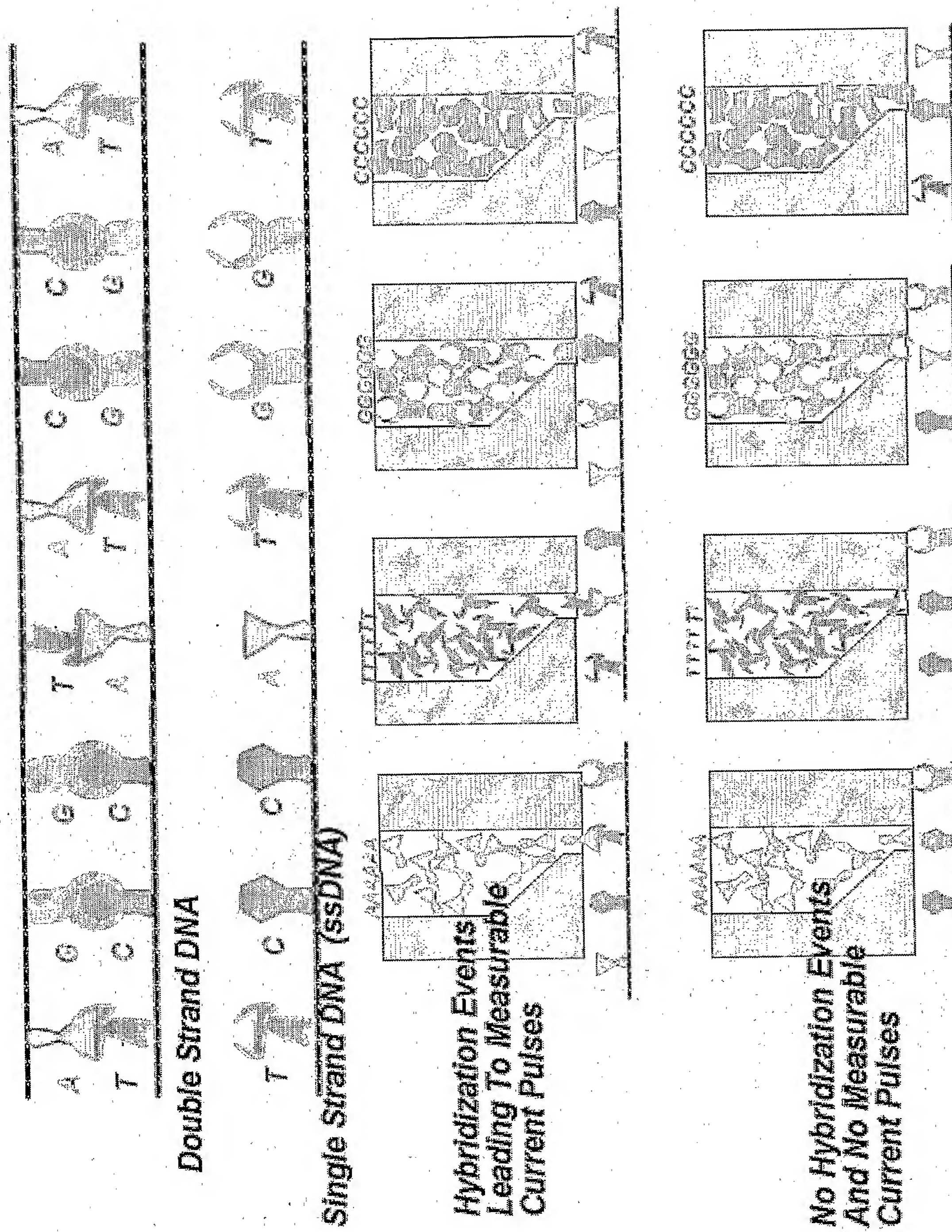


FIGURE 73

**All Possible 16 Combinations
Only 4 Produce Current Pulses
Upon A Hybridization Event**

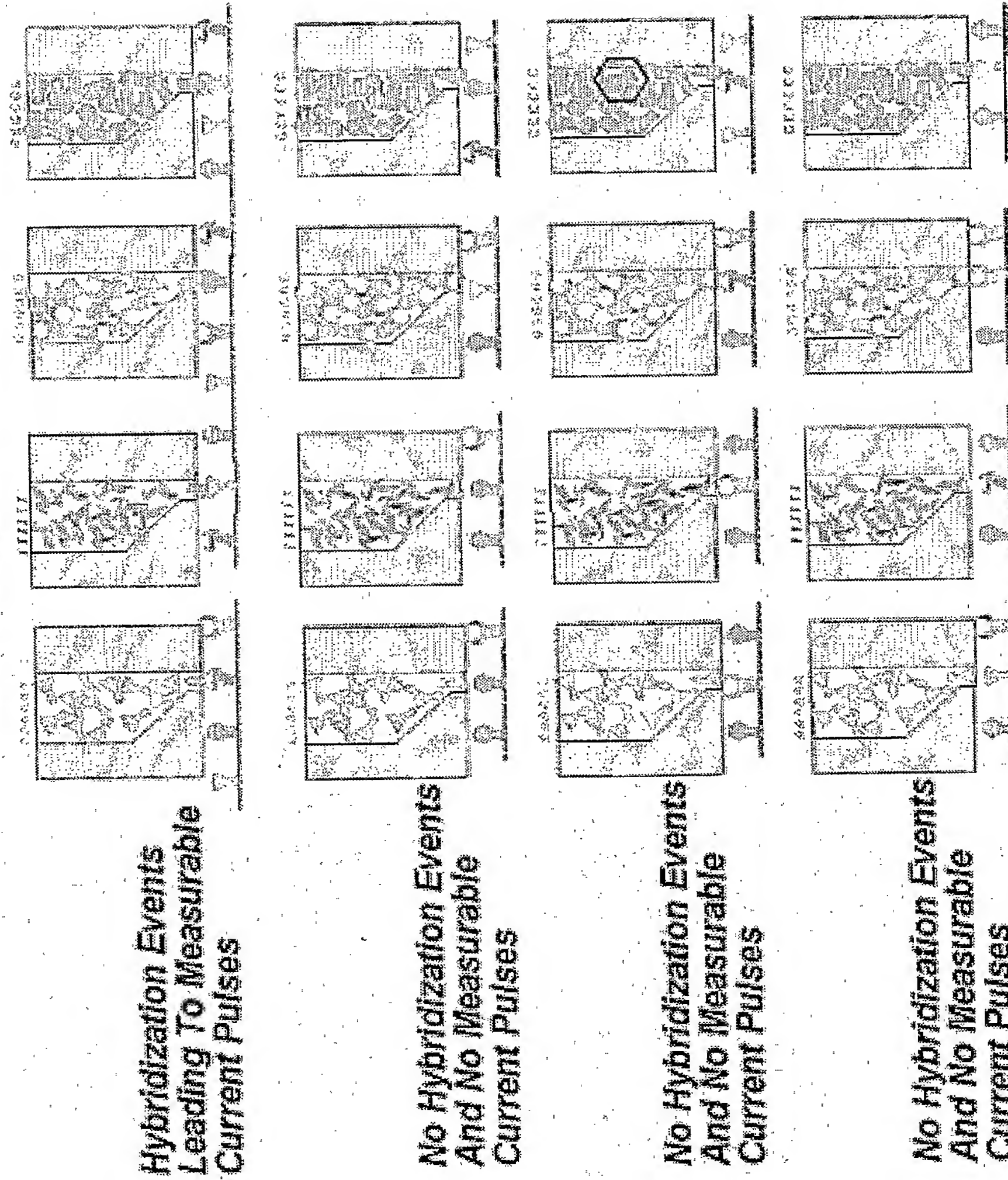


FIGURE 74

**Reference Position And
Precision nm Metrology**

- DNA base period $p_b = 0.5 \text{ nm}$
- Nozzle opening $x_N = p_b = 0.5 \text{ nm}$
- RPP size $< 0.5 \text{ nm}$
- First Nozzle distance from RPP = 10 nm
- Distance between Nozzles = 10 nm
- Motion Step = 0.1 nm
- $d_G = 10 \text{ nm} = 100 \text{ steps}$
- $d_T = 20 \text{ nm} = 200 \text{ steps}$
- $d_C = 30 \text{ nm} = 300 \text{ steps}$
- $d_A = 40 \text{ nm} = 400 \text{ steps}$
- Channel Depth = $< 10 \text{ nm}$

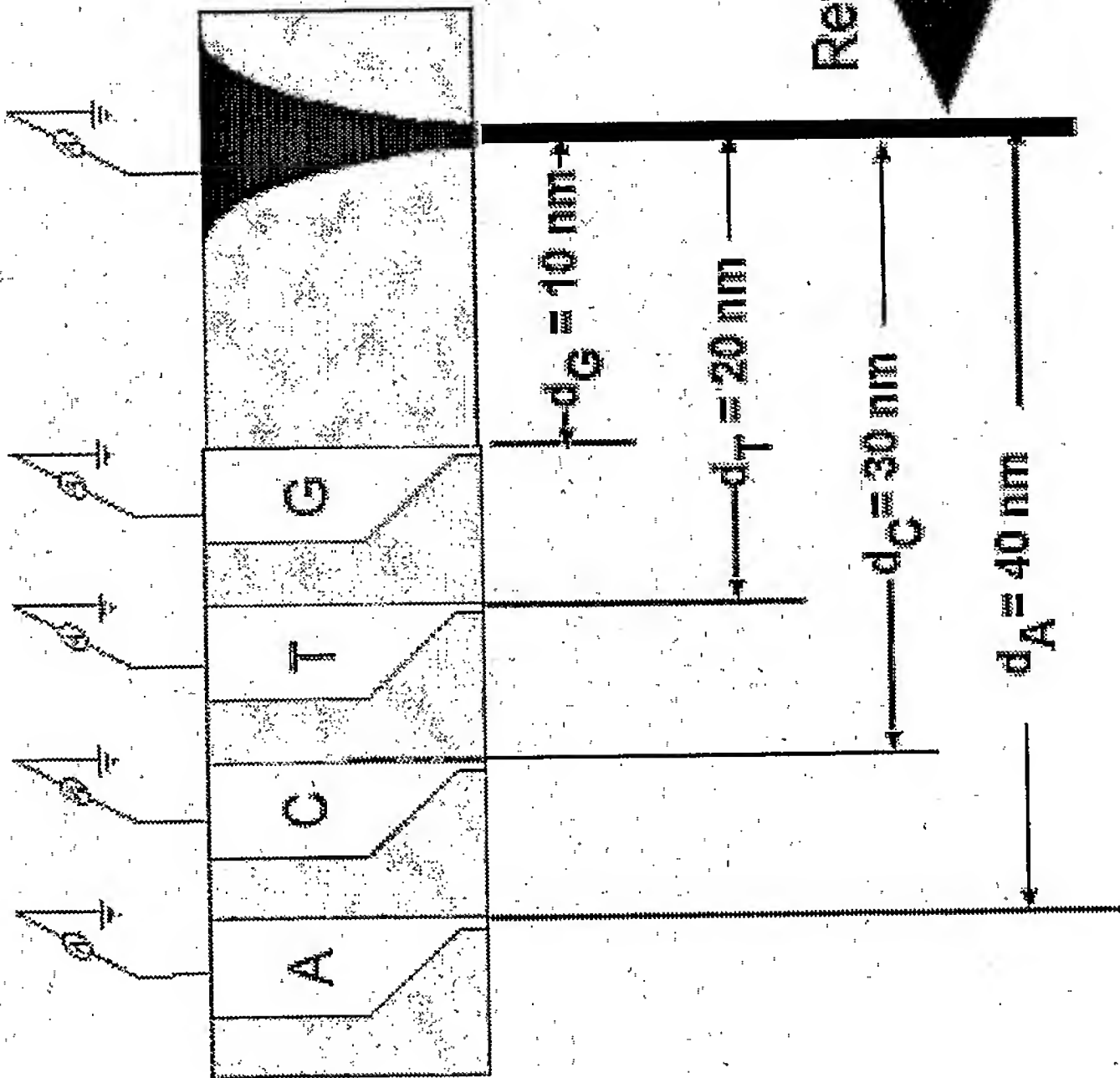


FIGURE 75

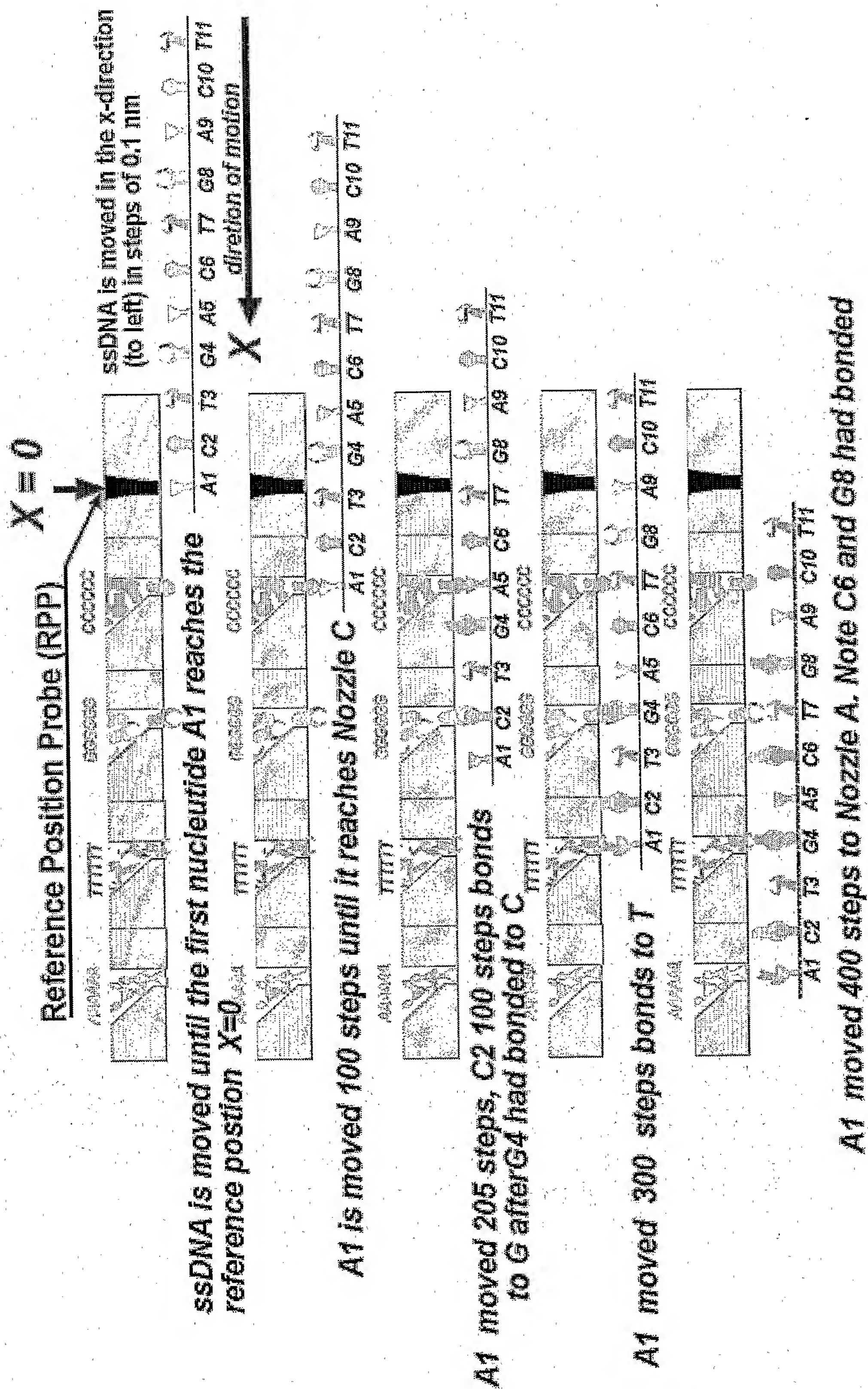


FIGURE 76

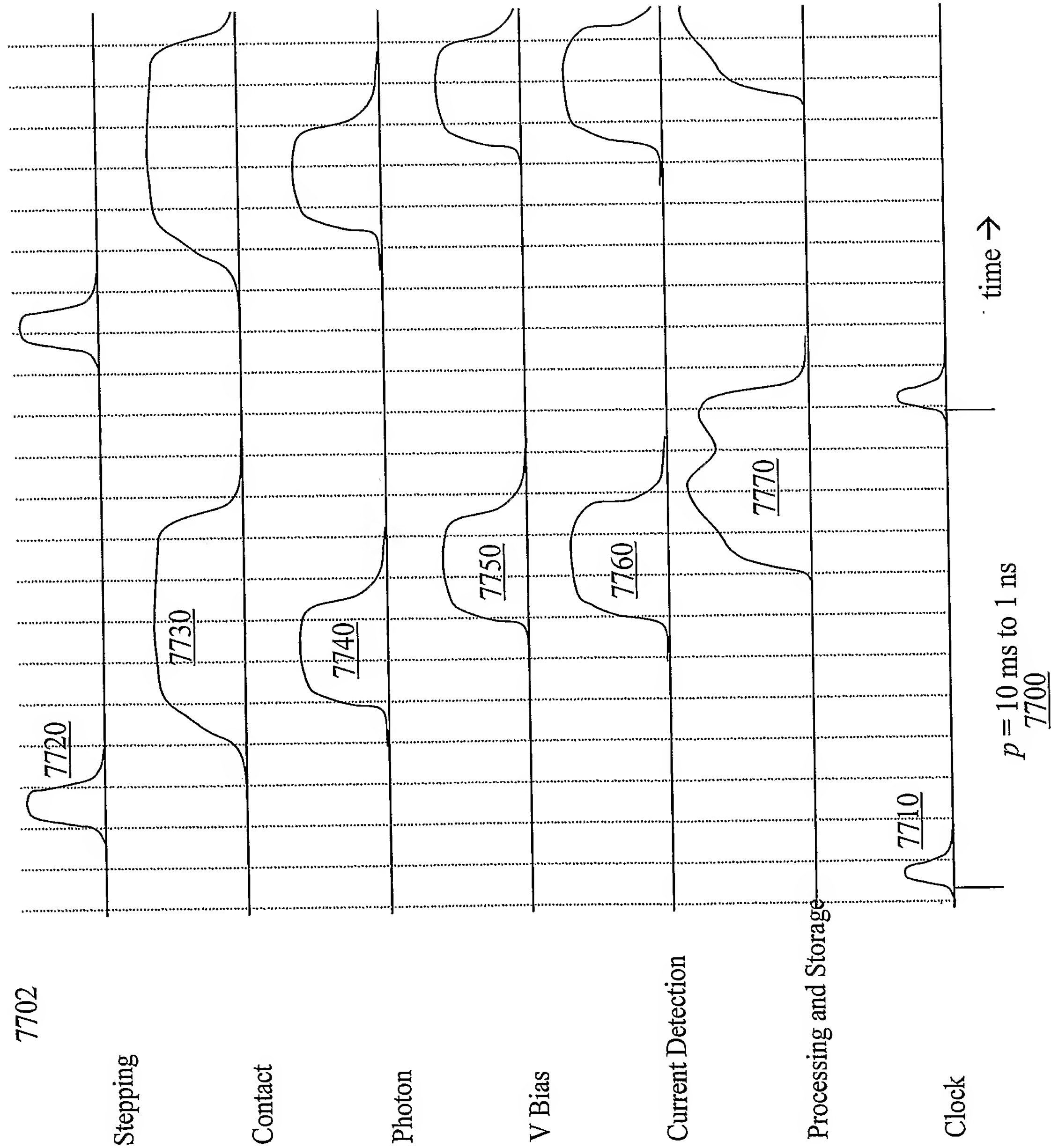


FIGURE 77

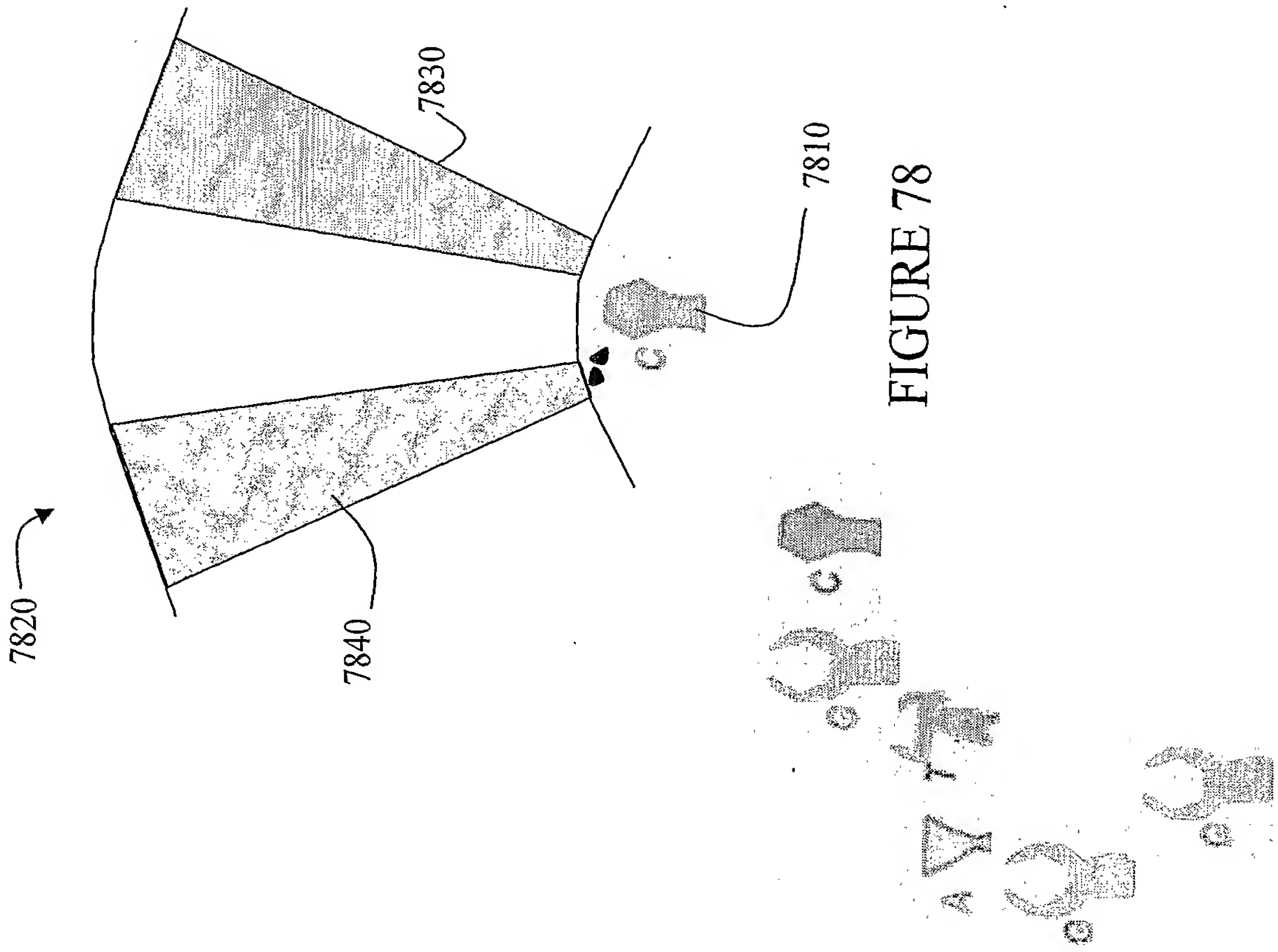


FIGURE 78

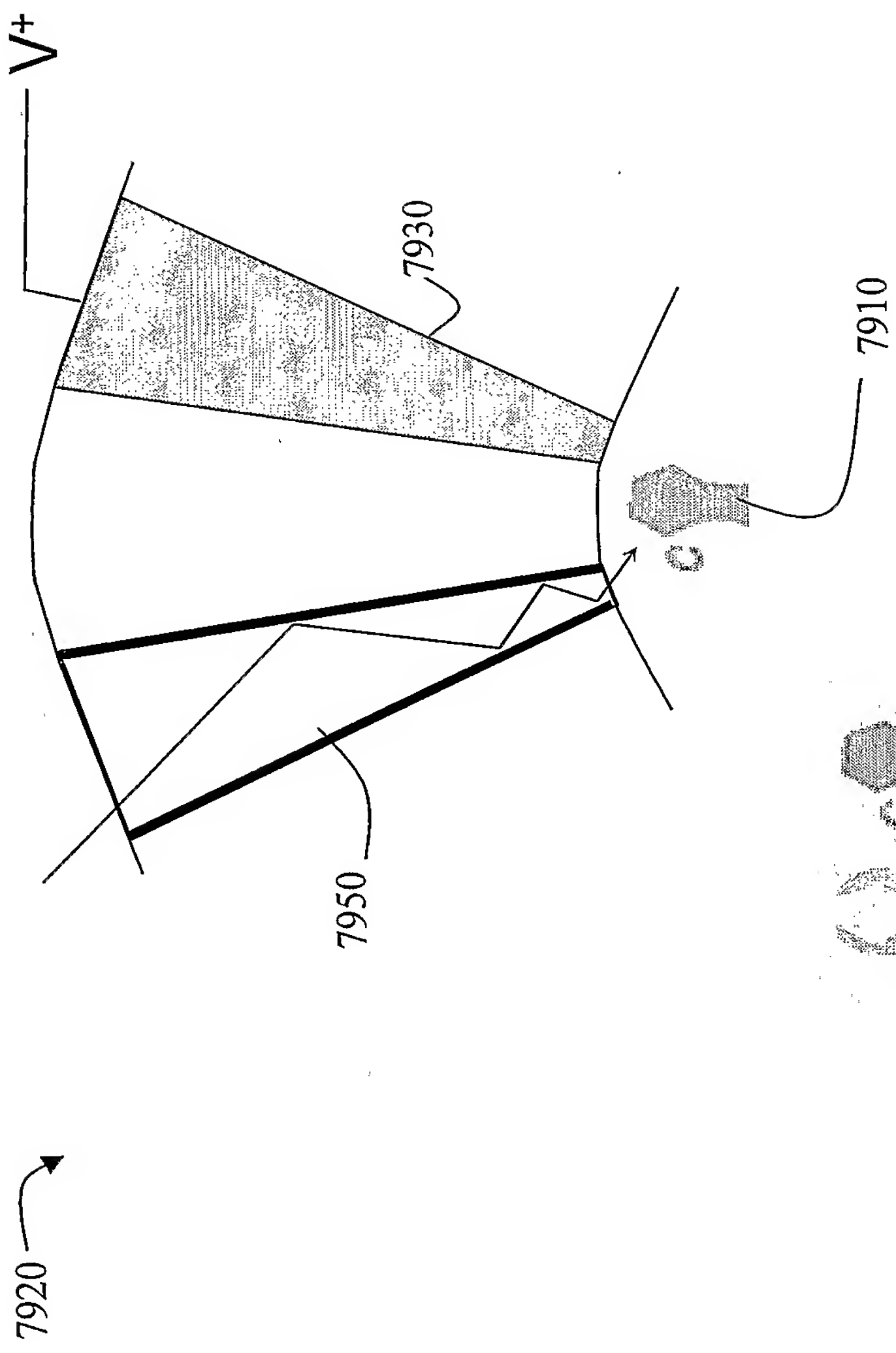
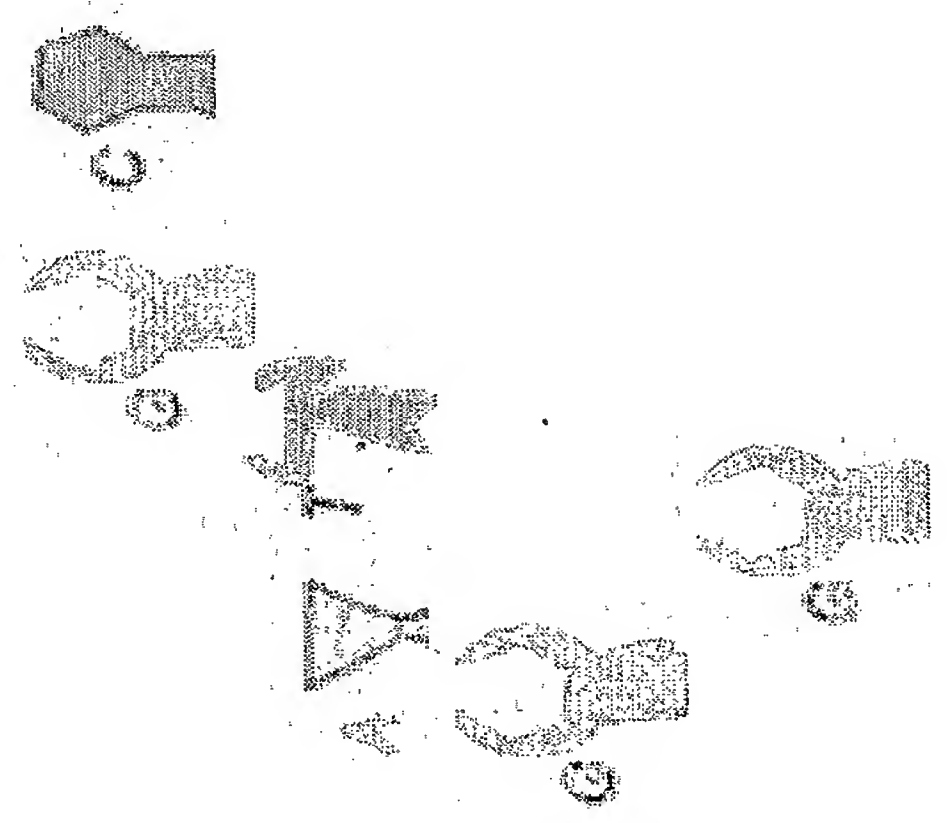
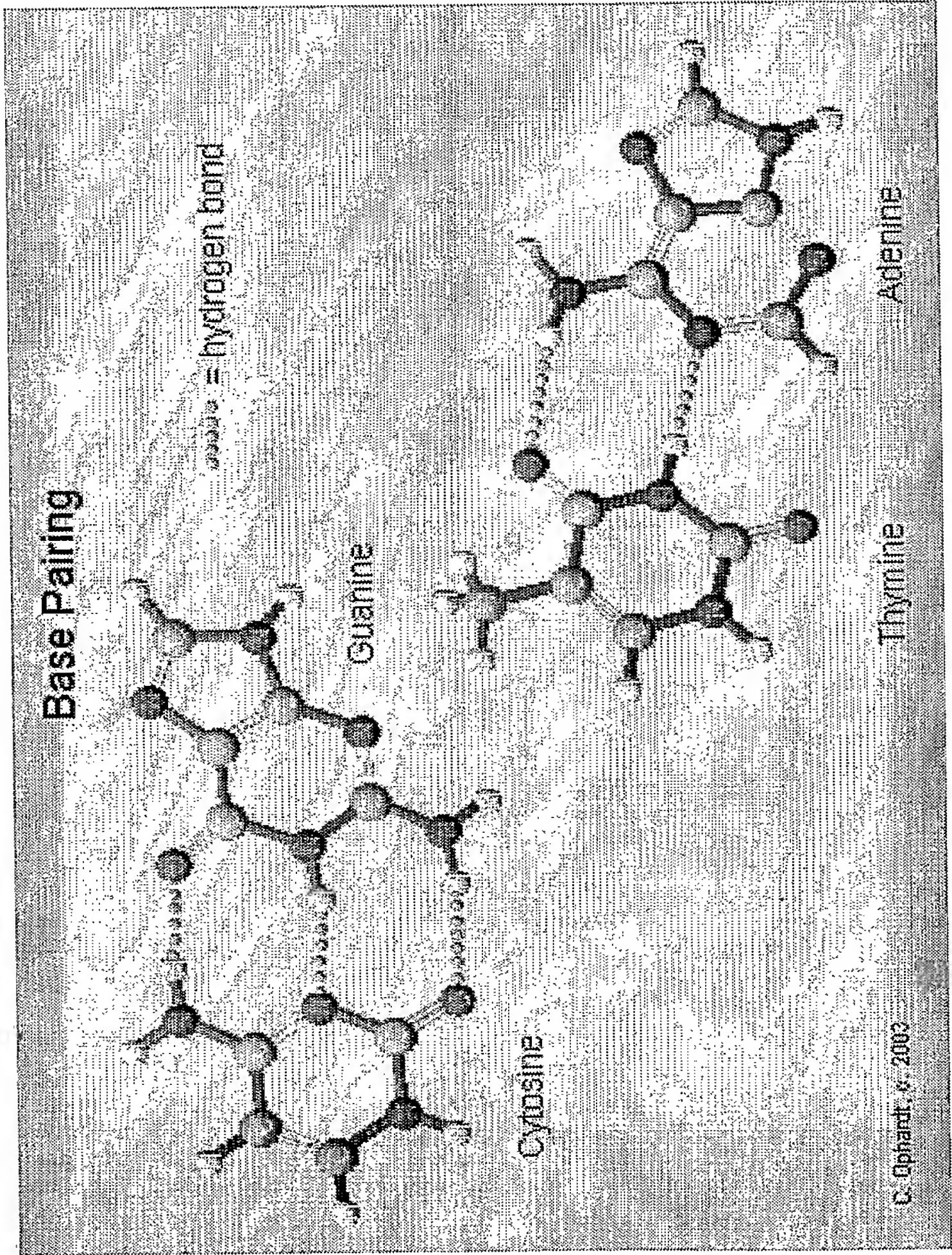


FIGURE 79





<http://www.elmhurst.edu/~chm/vchembook/582dnadoublehelix.html>

FIGURE 80

Quantum Tunneling

$$I \sim \exp(-As)$$

$$A = f(V, t, \omega, \dots)$$

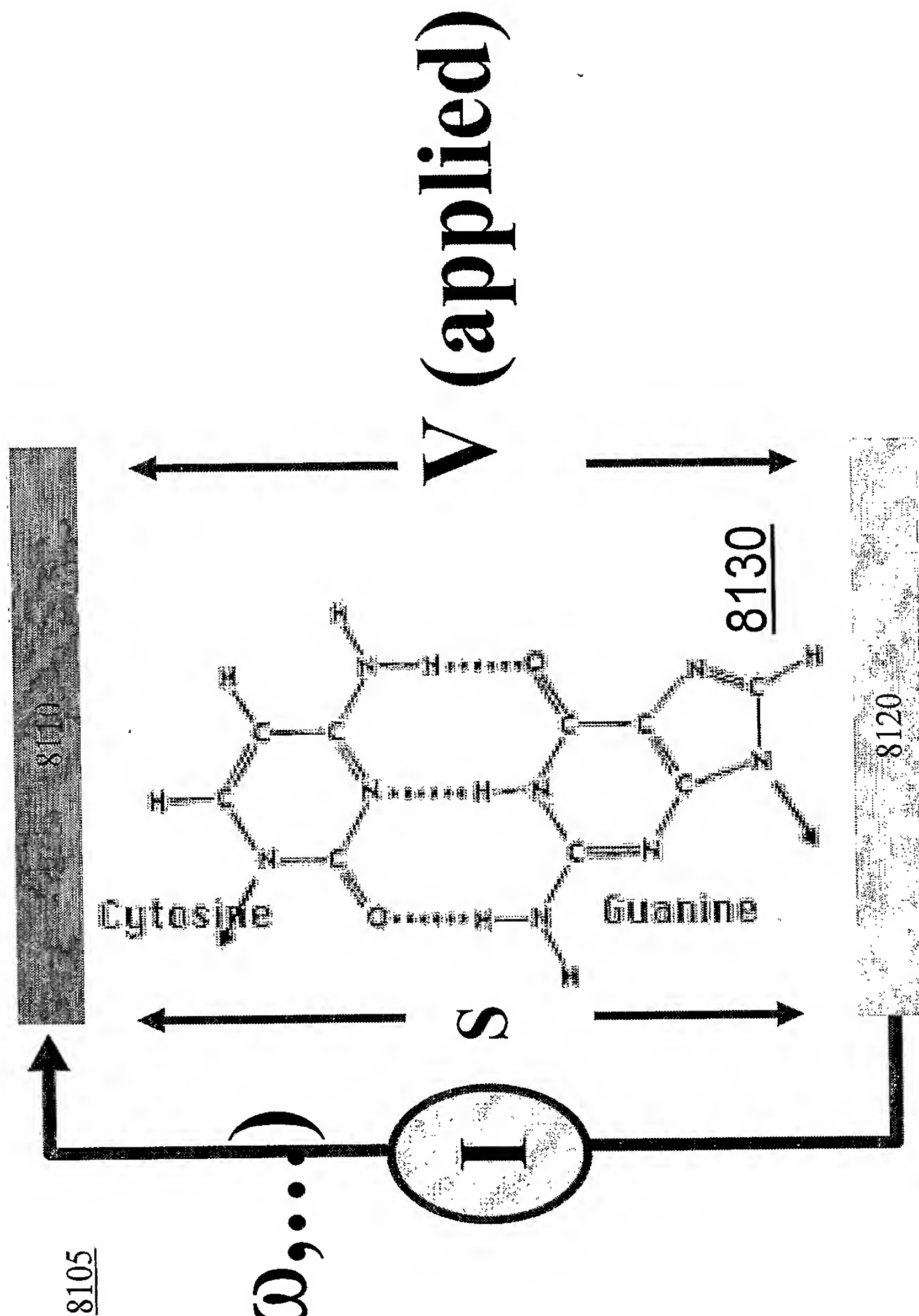


FIGURE 81

Elastic Tunneling

$$I \sim \exp(-As)$$

$$A = f(V, t, \omega, \dots)$$

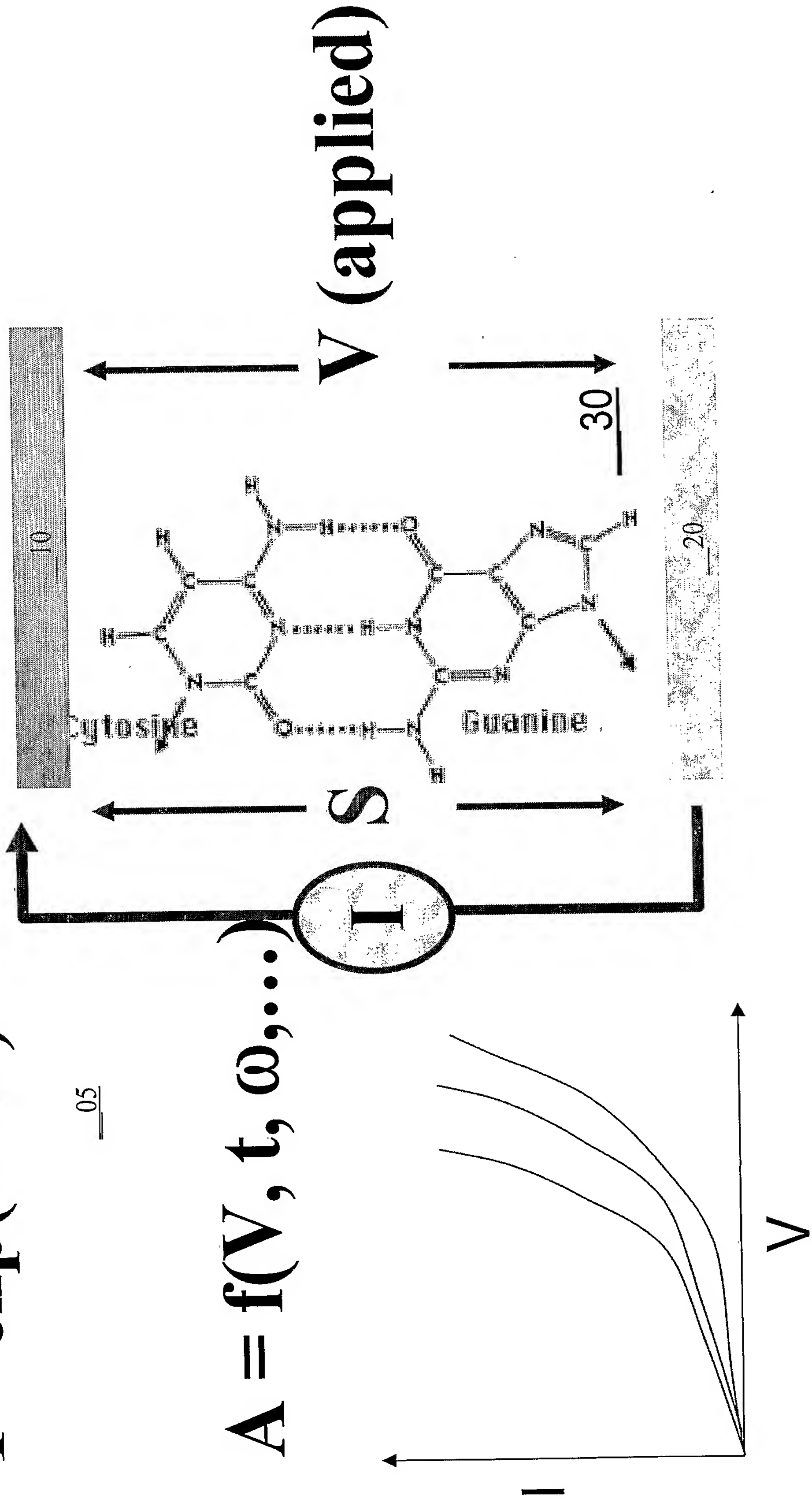


FIGURE 82

Inelastic Tunneling

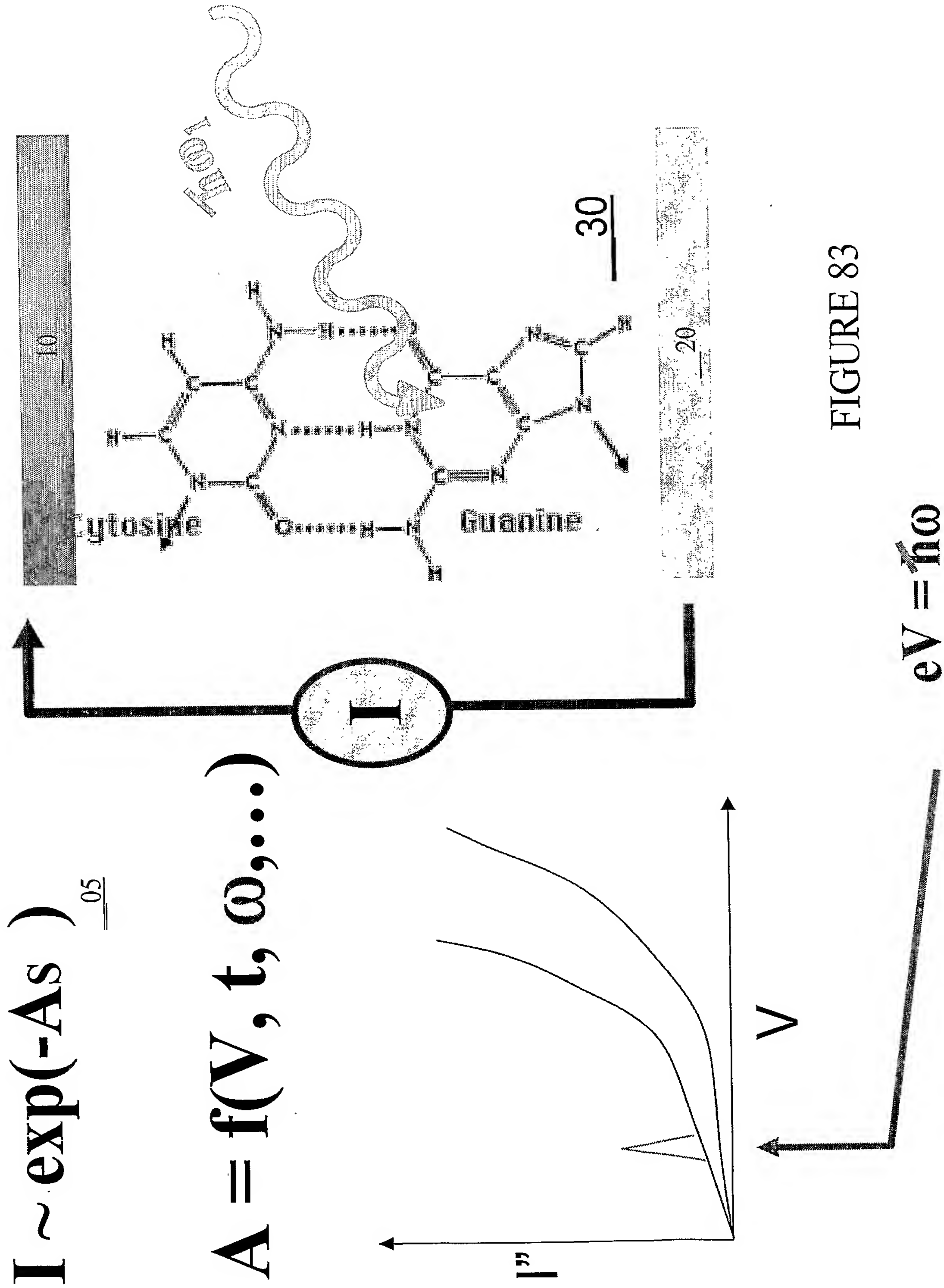


FIGURE 83

$$E_{qc} = \frac{1}{2} (Cq V^2) / KT >> 1$$

06

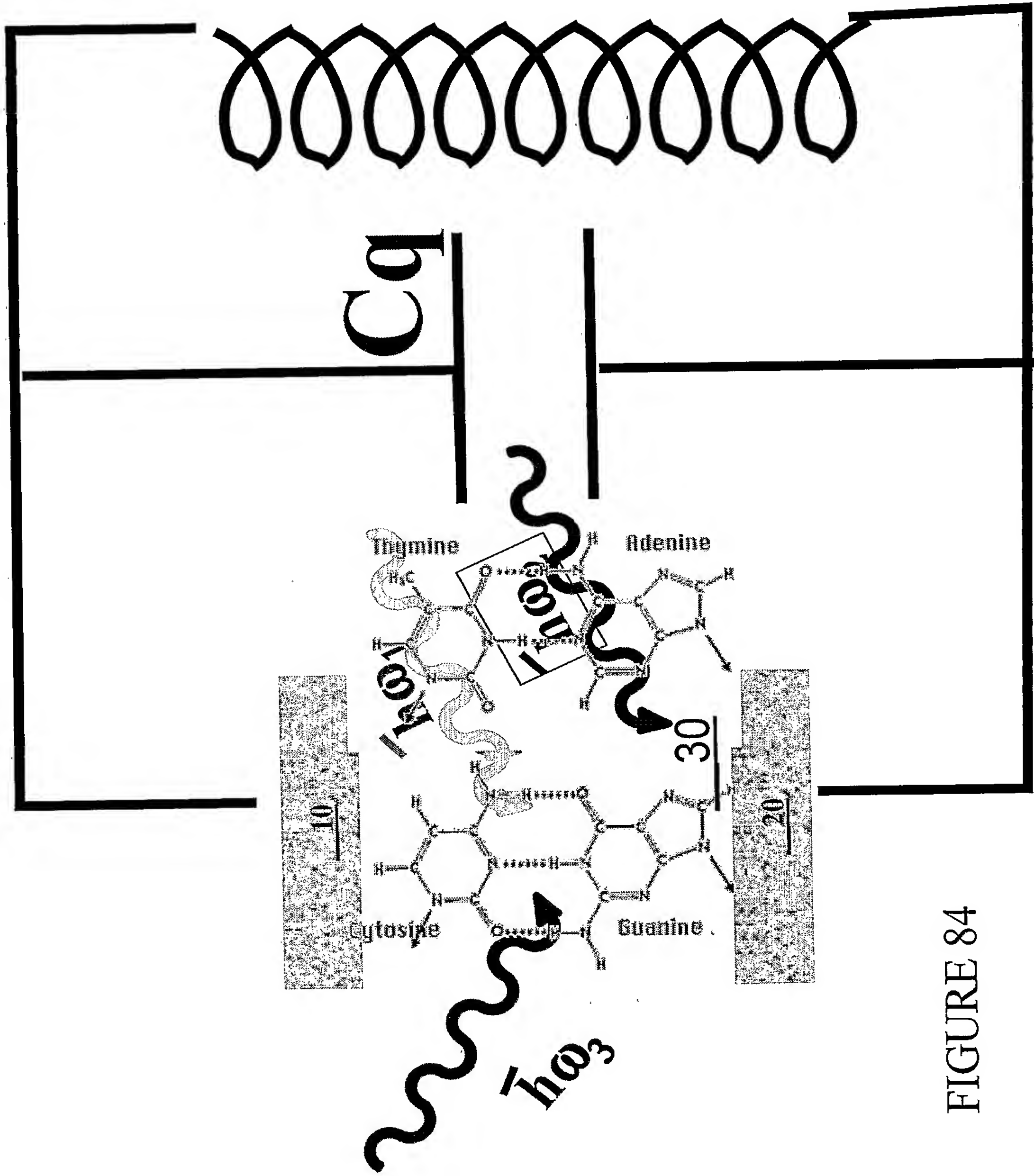


FIGURE 84

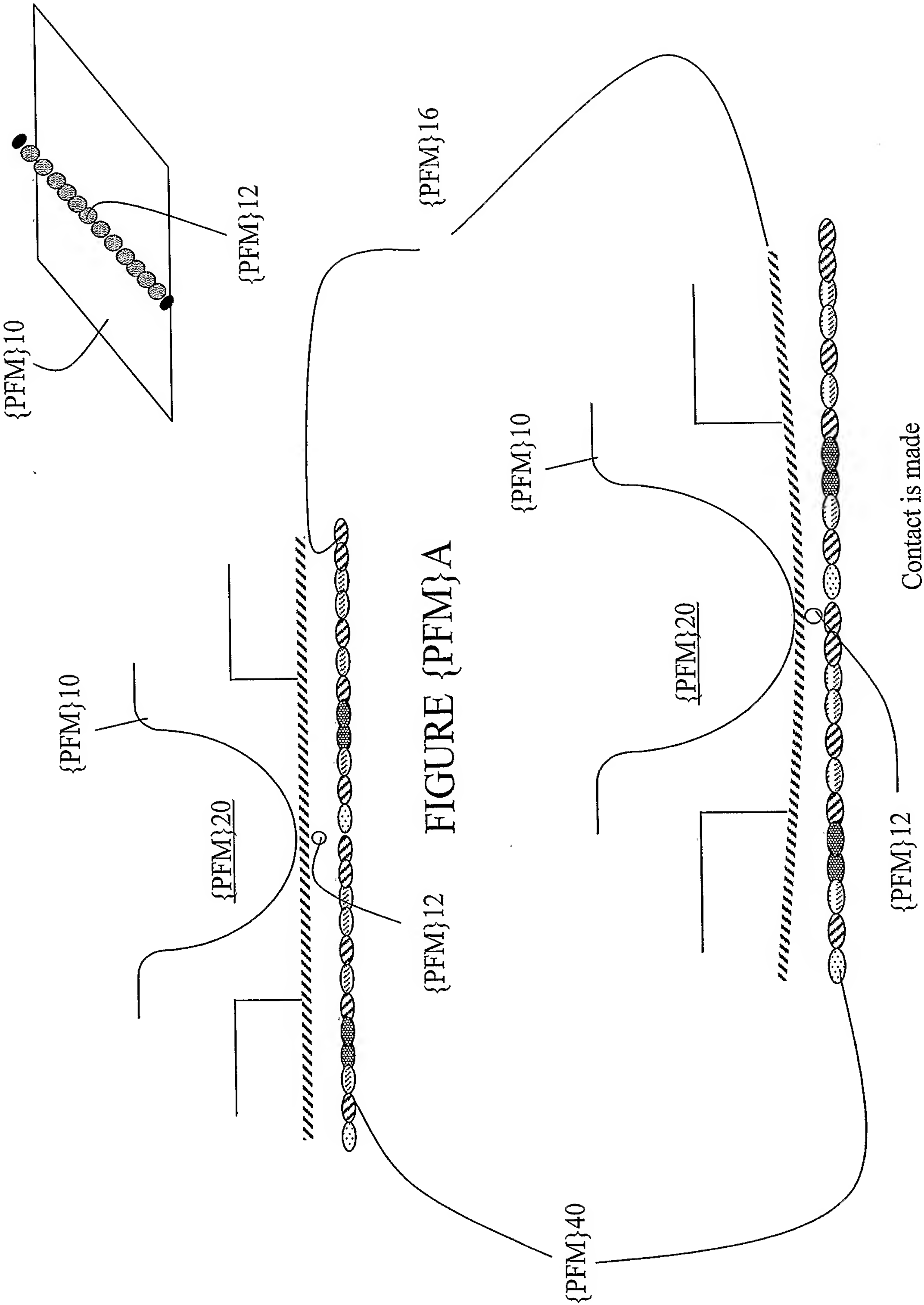
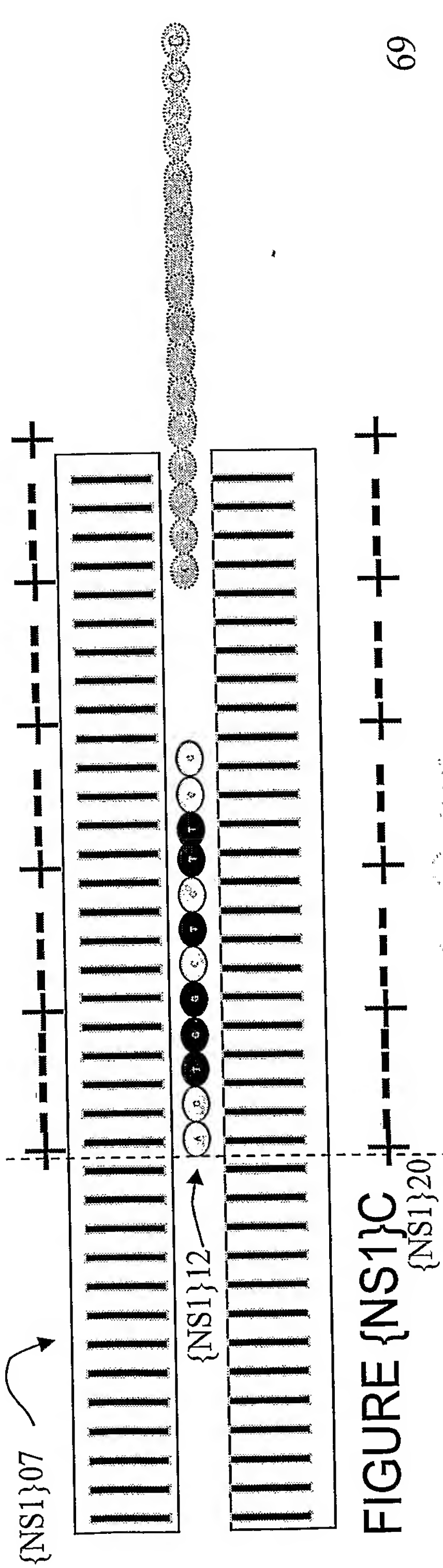
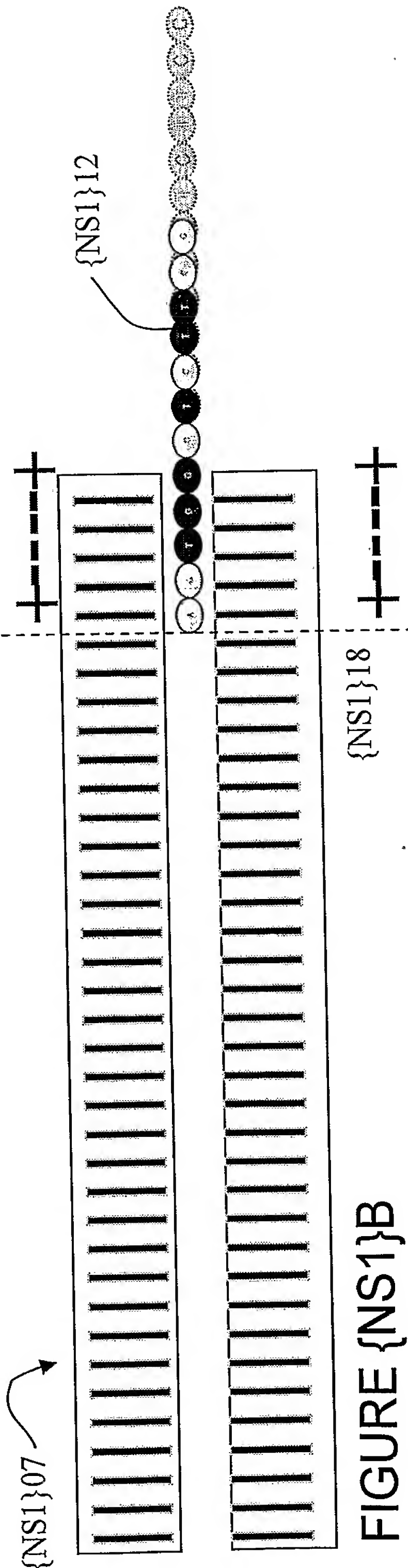
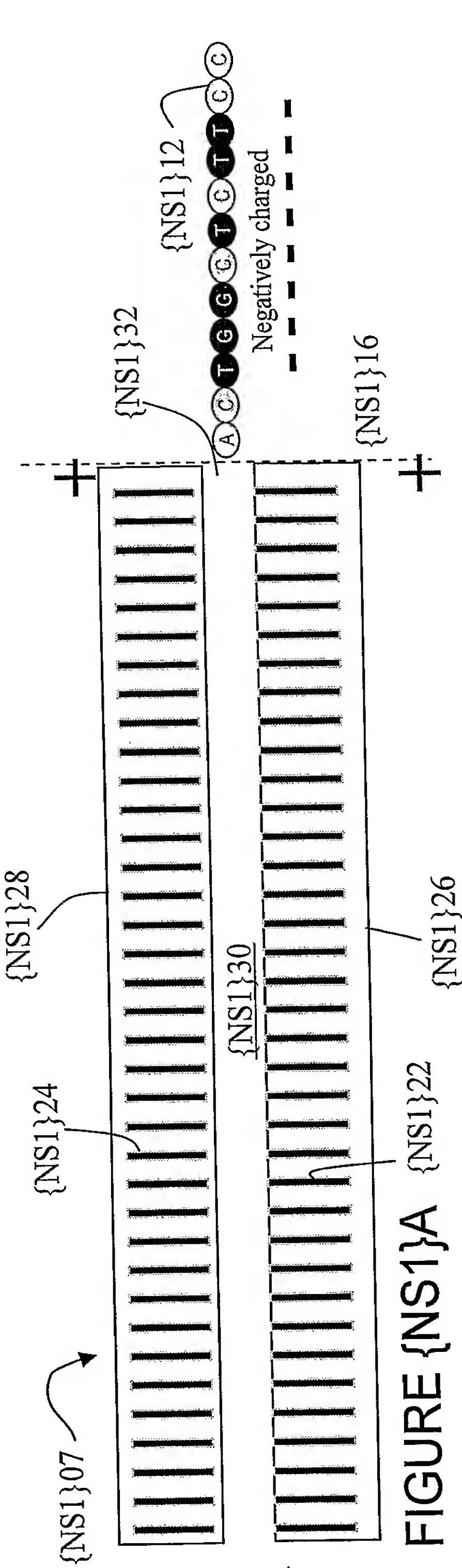


FIGURE {PFM}B



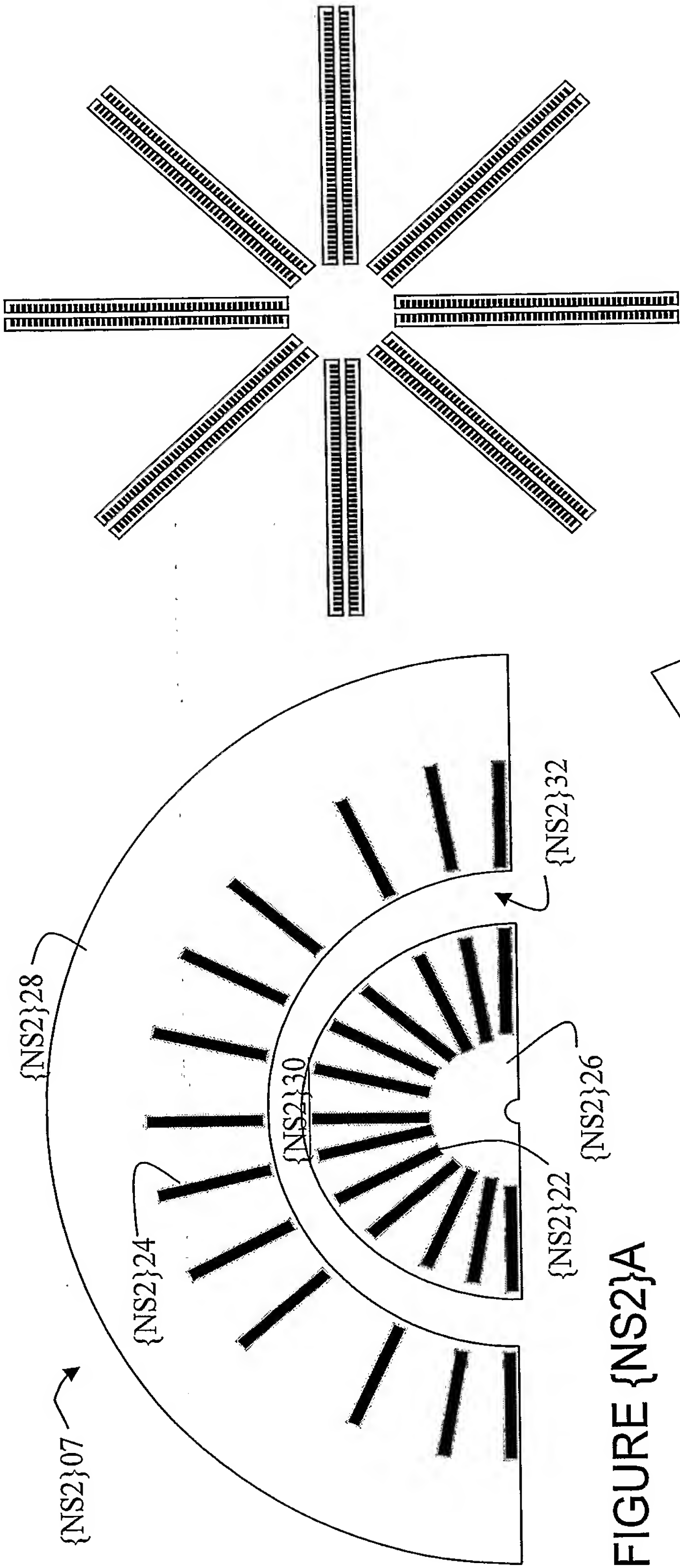


FIGURE {NS2}A

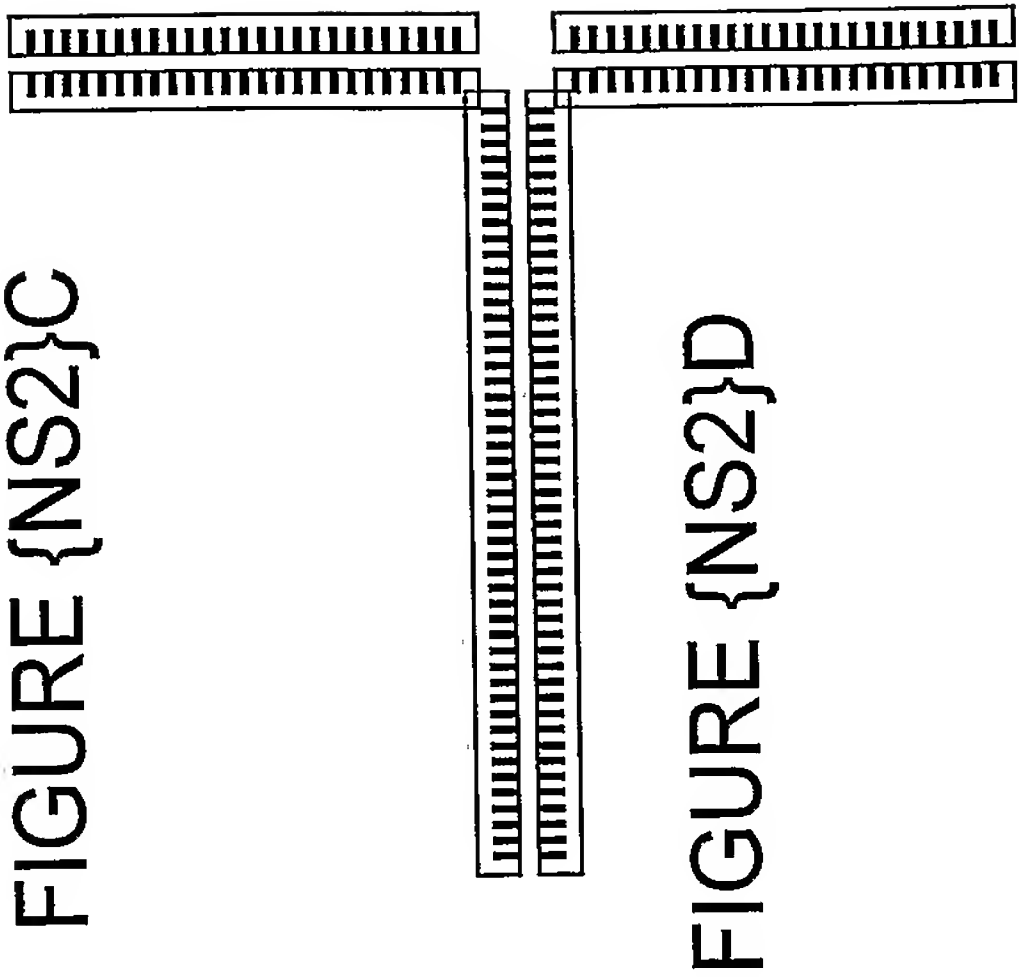


FIGURE {NS2}C

FIGURE {NS2}D

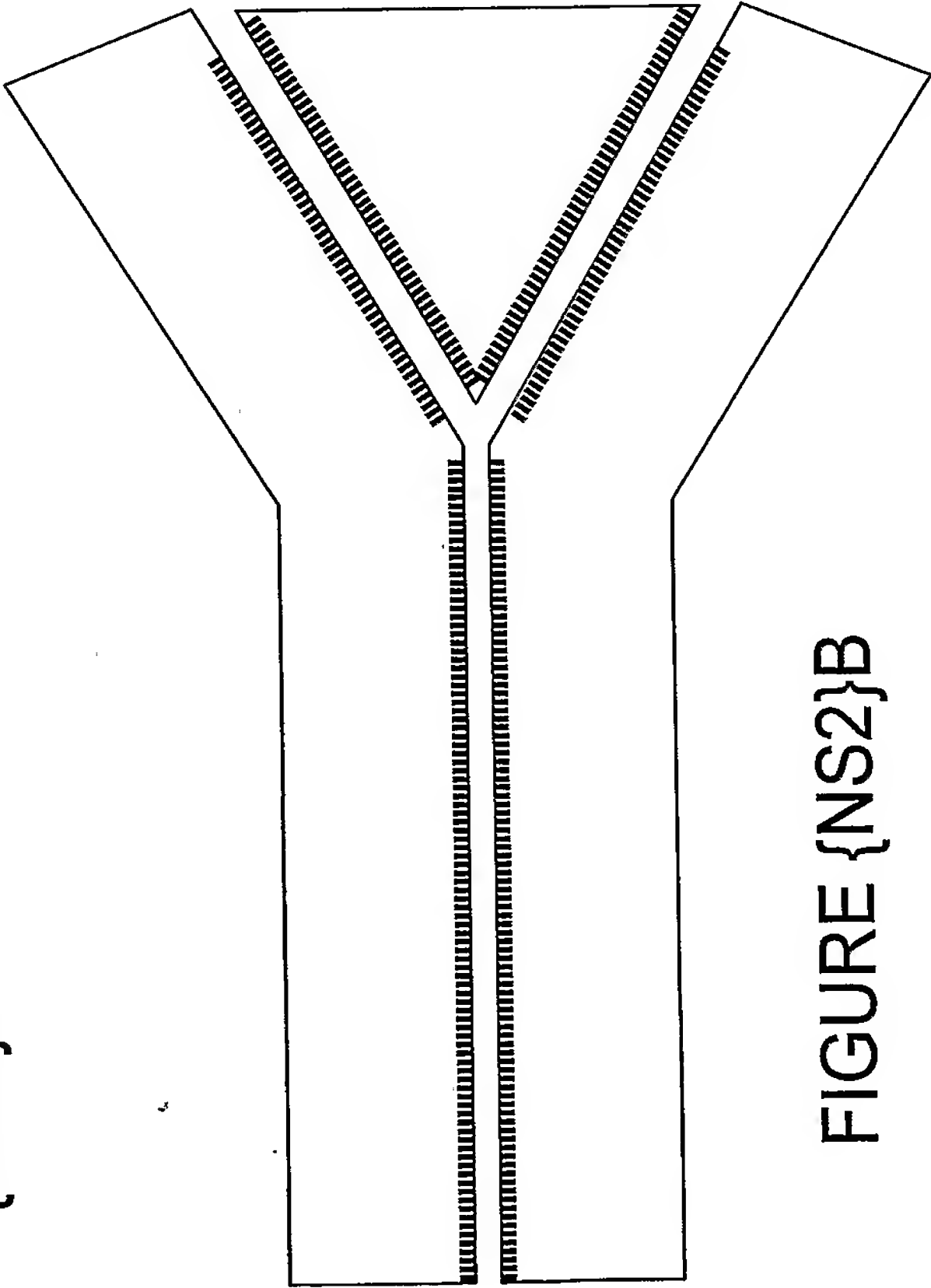


FIGURE {NS2}B

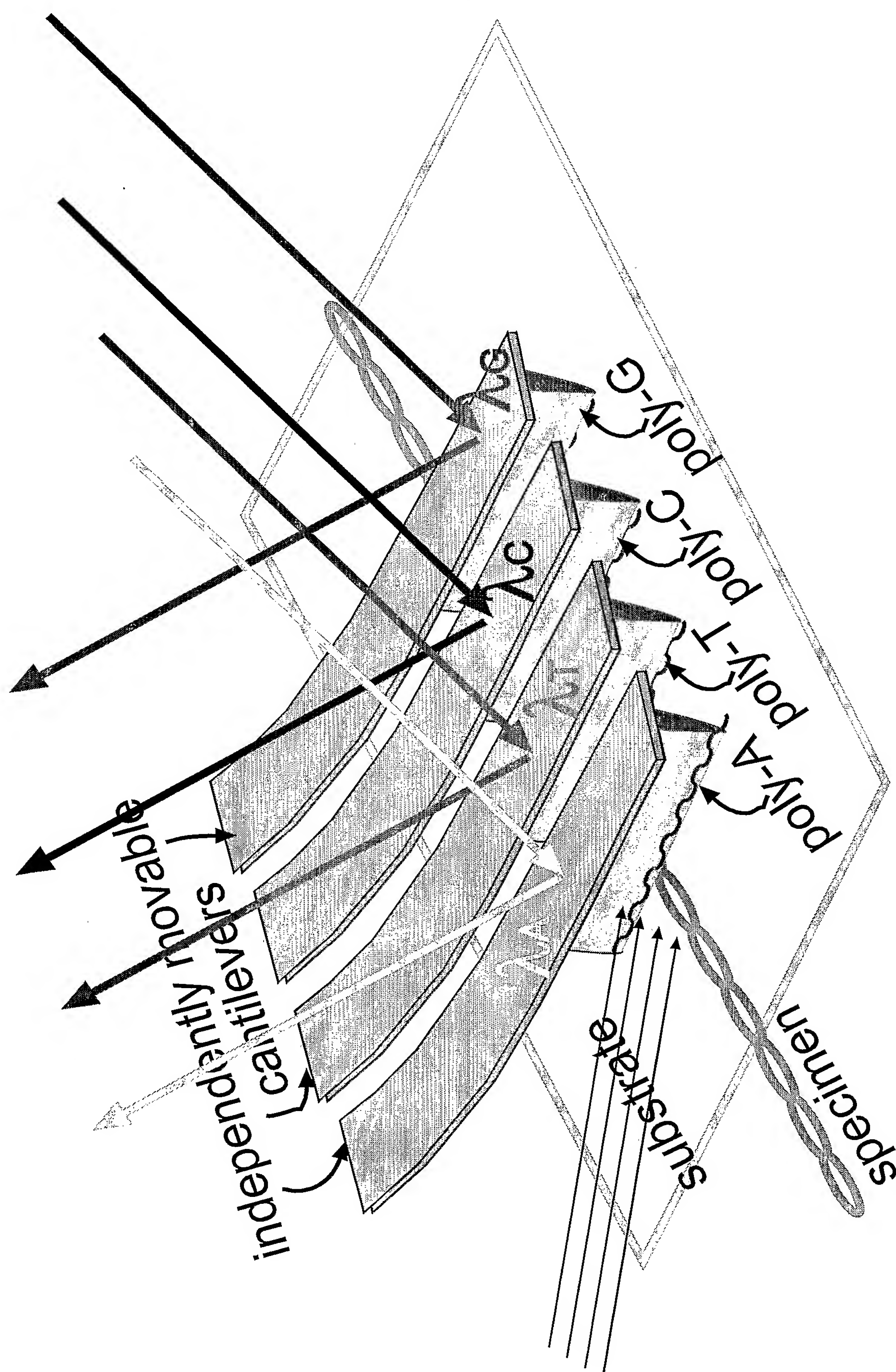


Figure {AFM1}

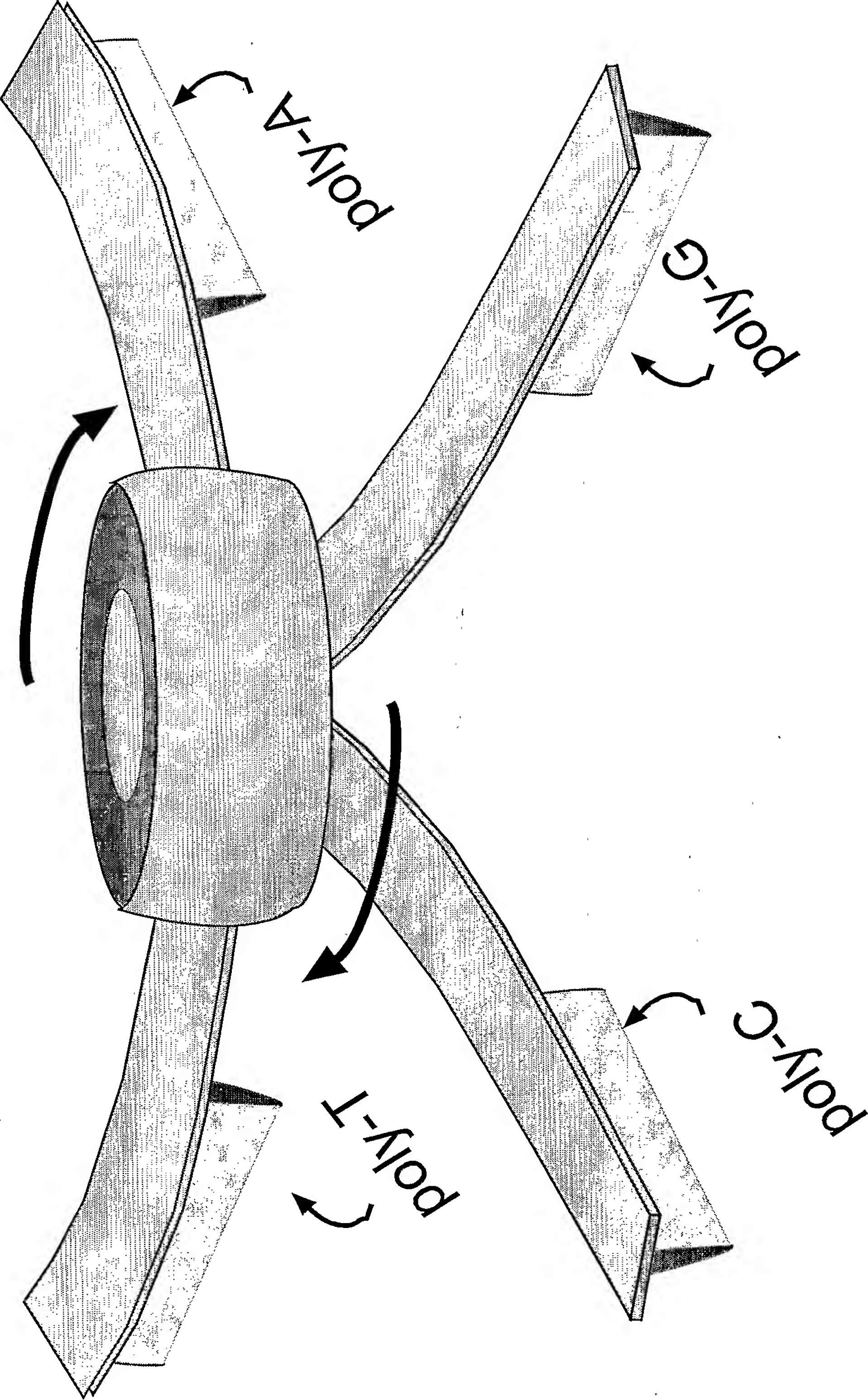


Figure {AFM2}

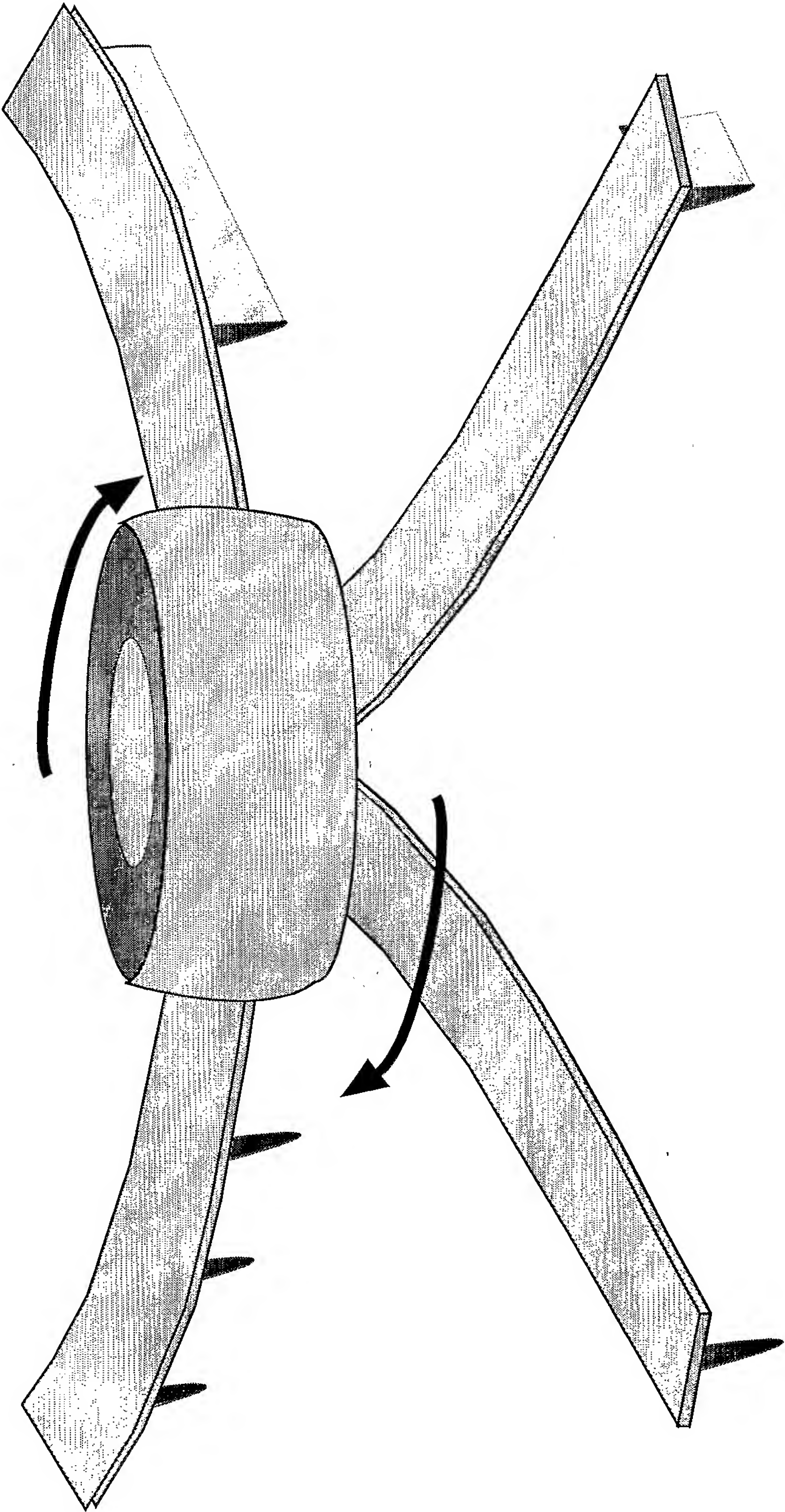


Figure {AFM3}

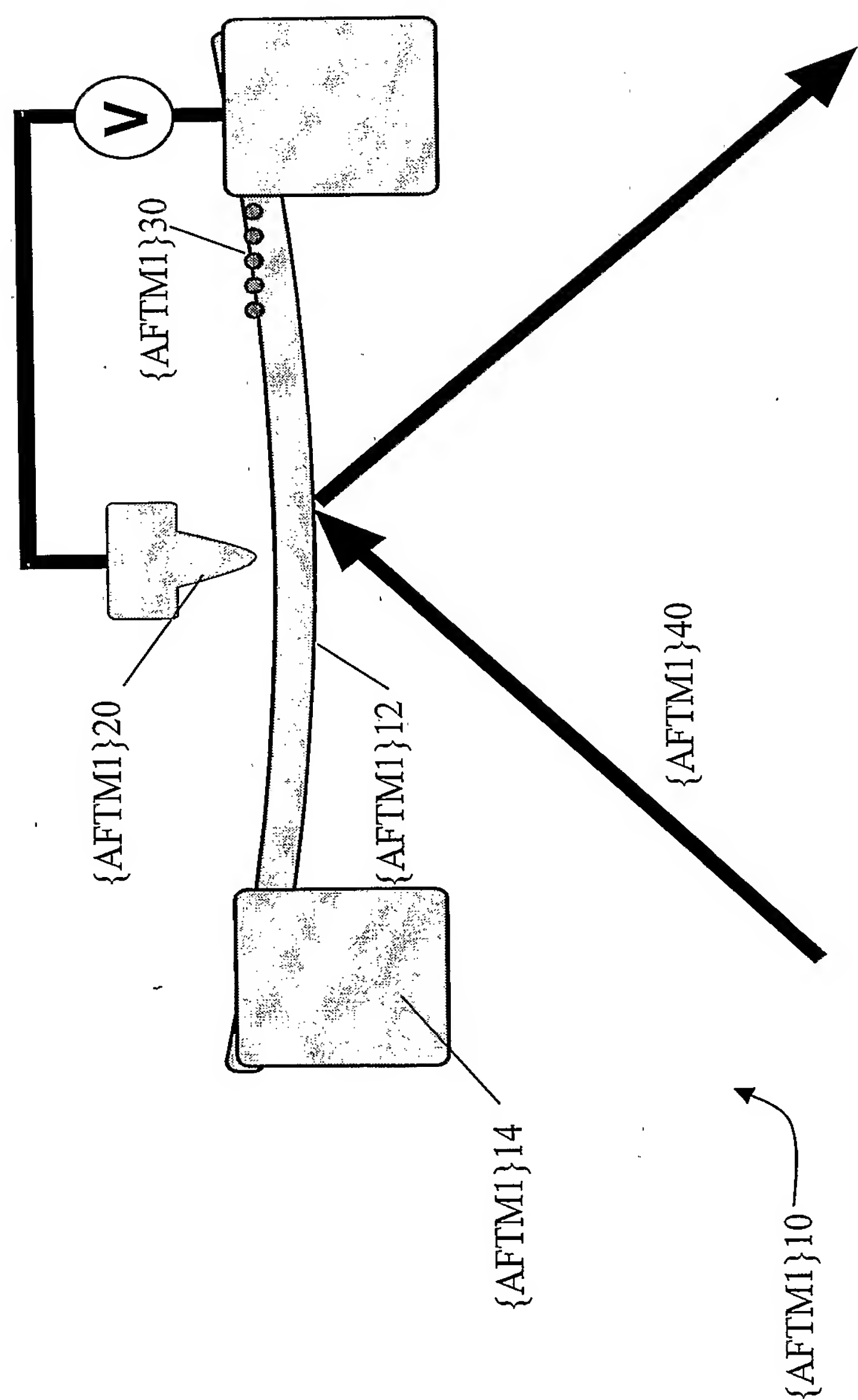


Figure {AFTM1}

**Membrane AFM capacitively read and STM combination
Images first them sequences with daisy wheel probes
and alignemnt marks**

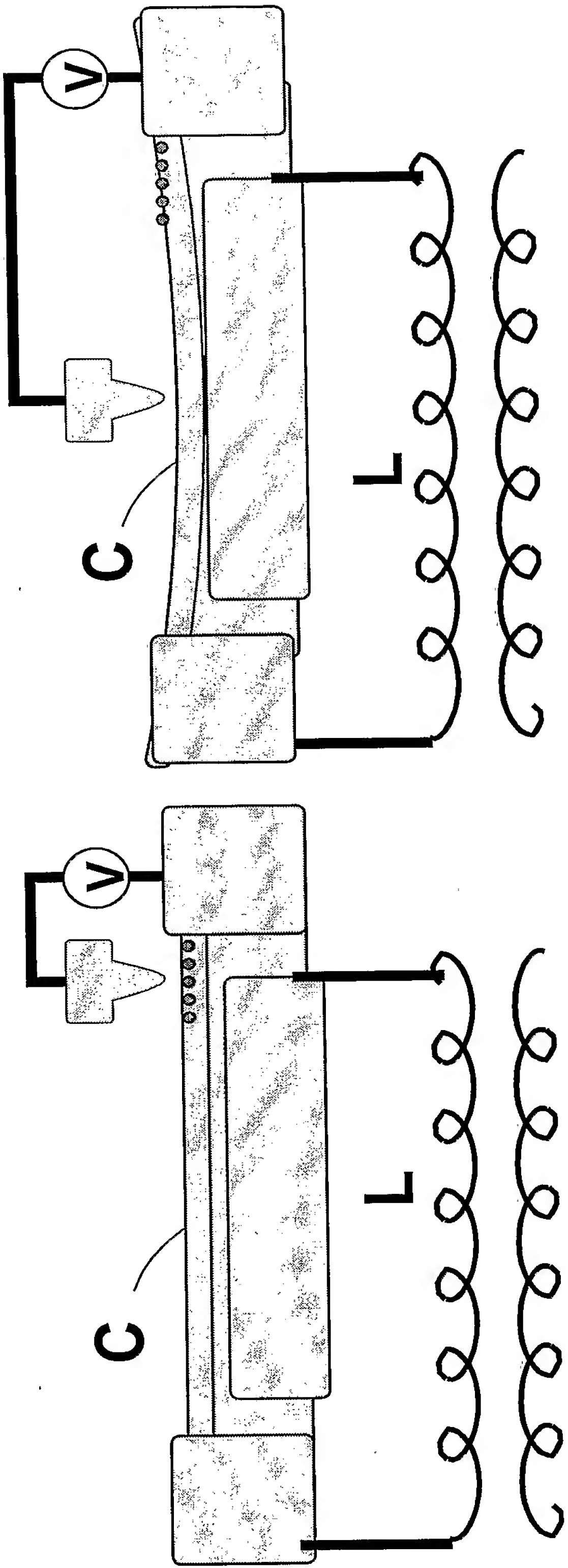


Figure {AFTM2}A

Figure {AFTM2}B

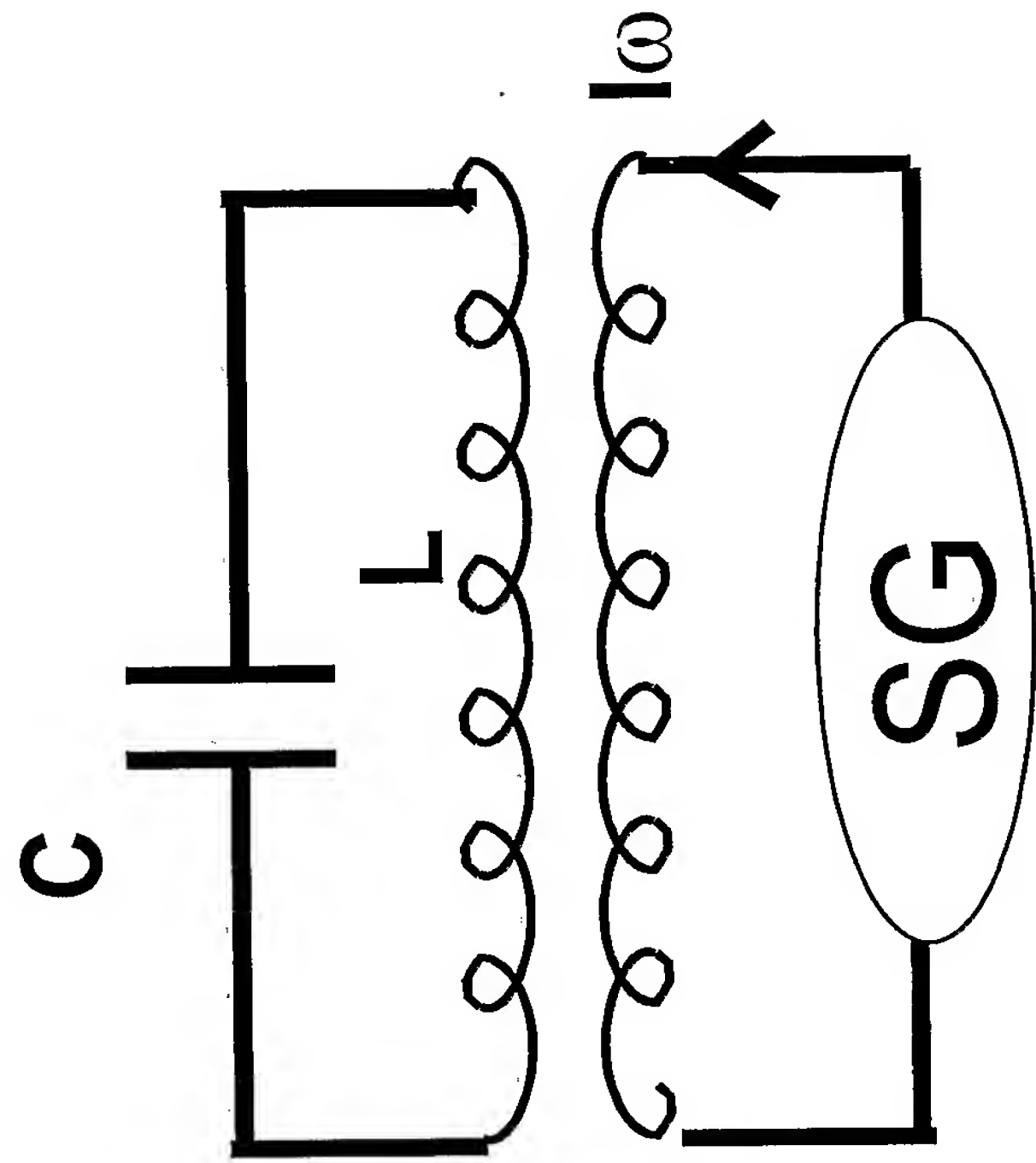


Figure {AFTM2}C

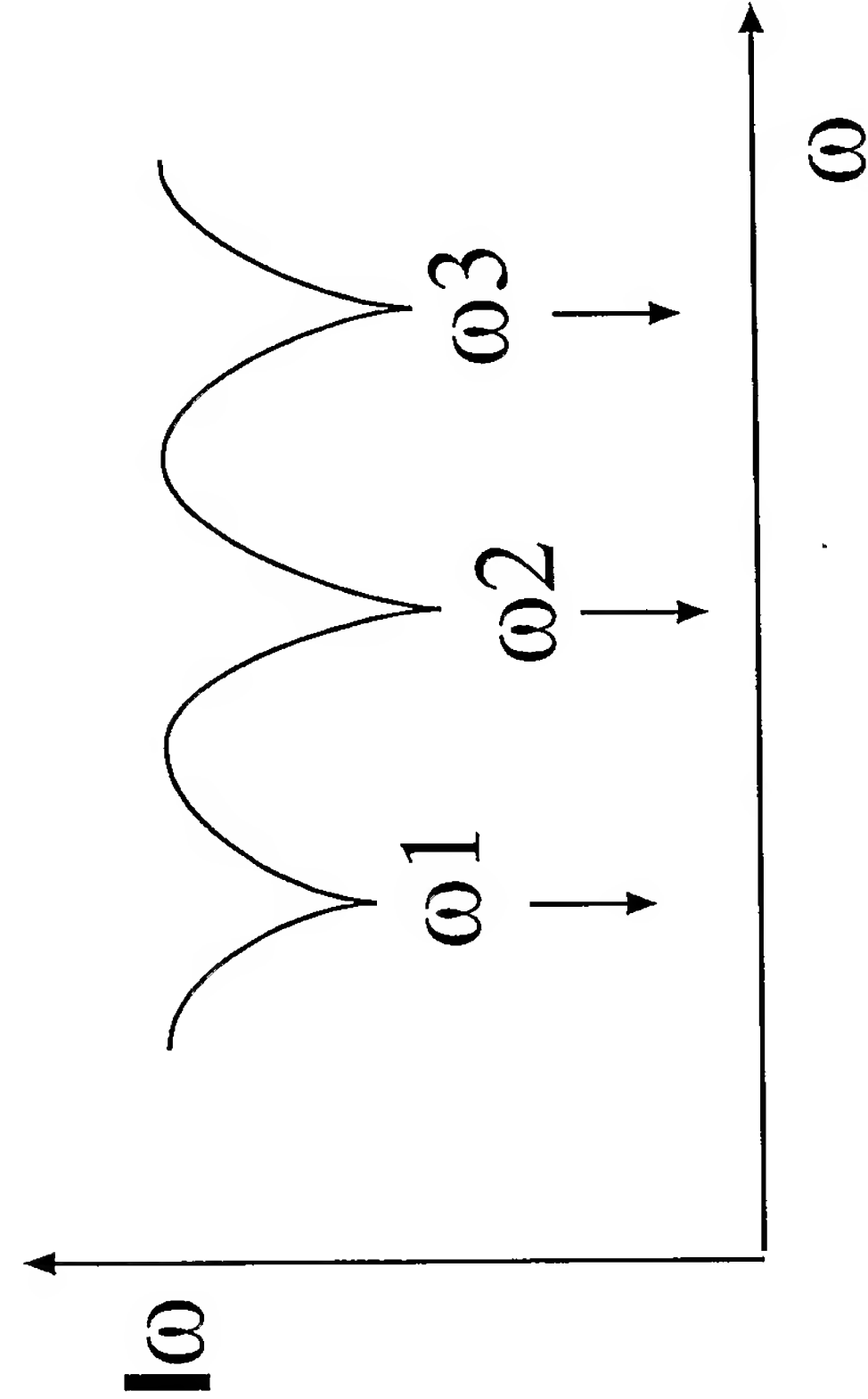


Figure {AFTM2}D

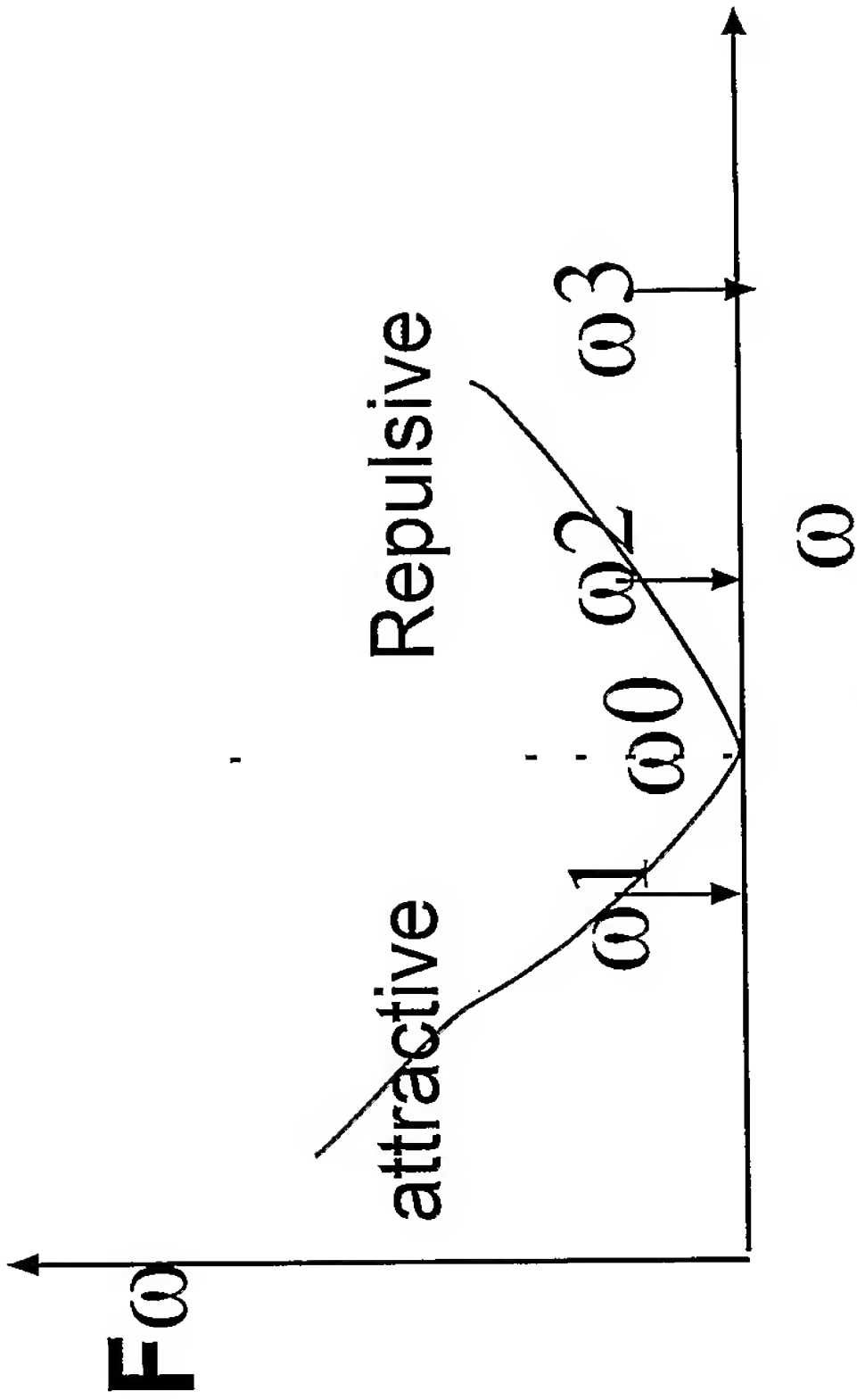


Figure {AFTM2}E

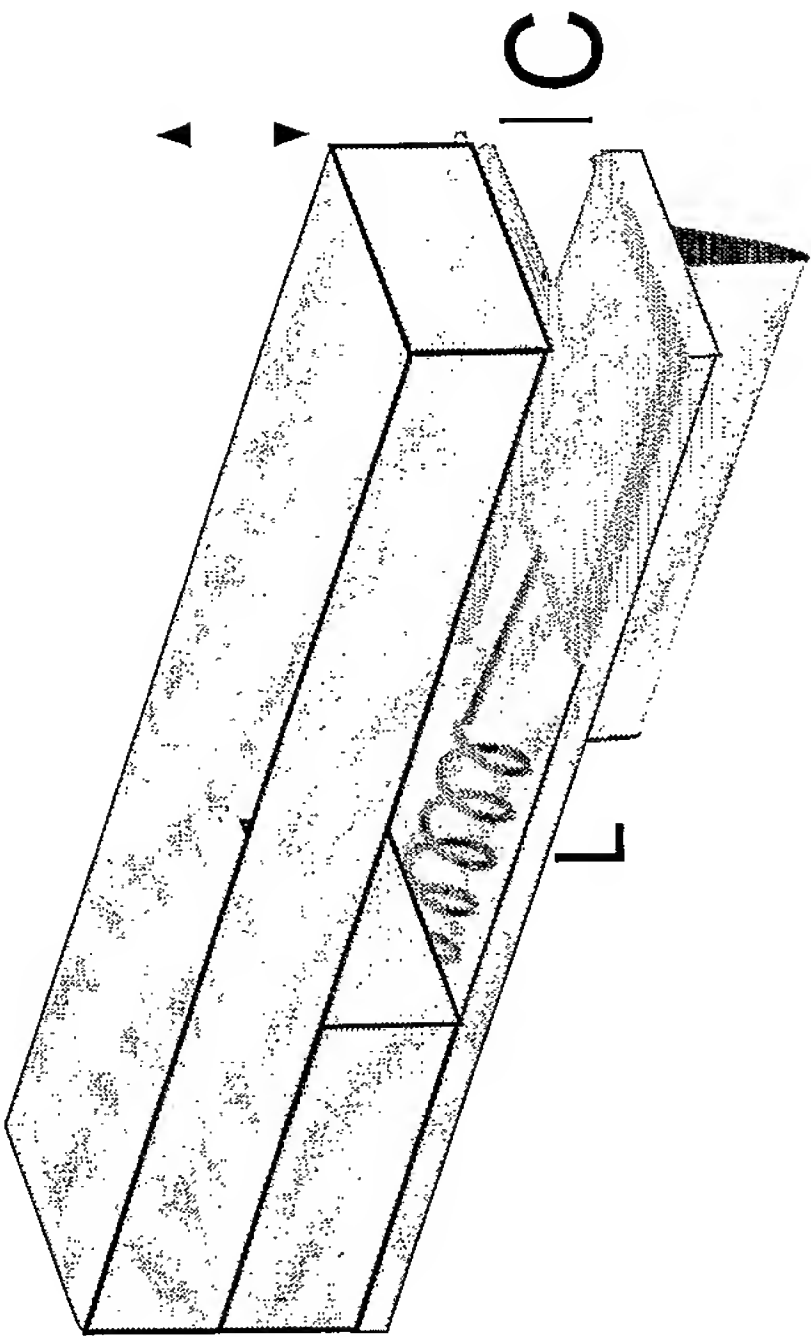


Figure {AFTM3}A

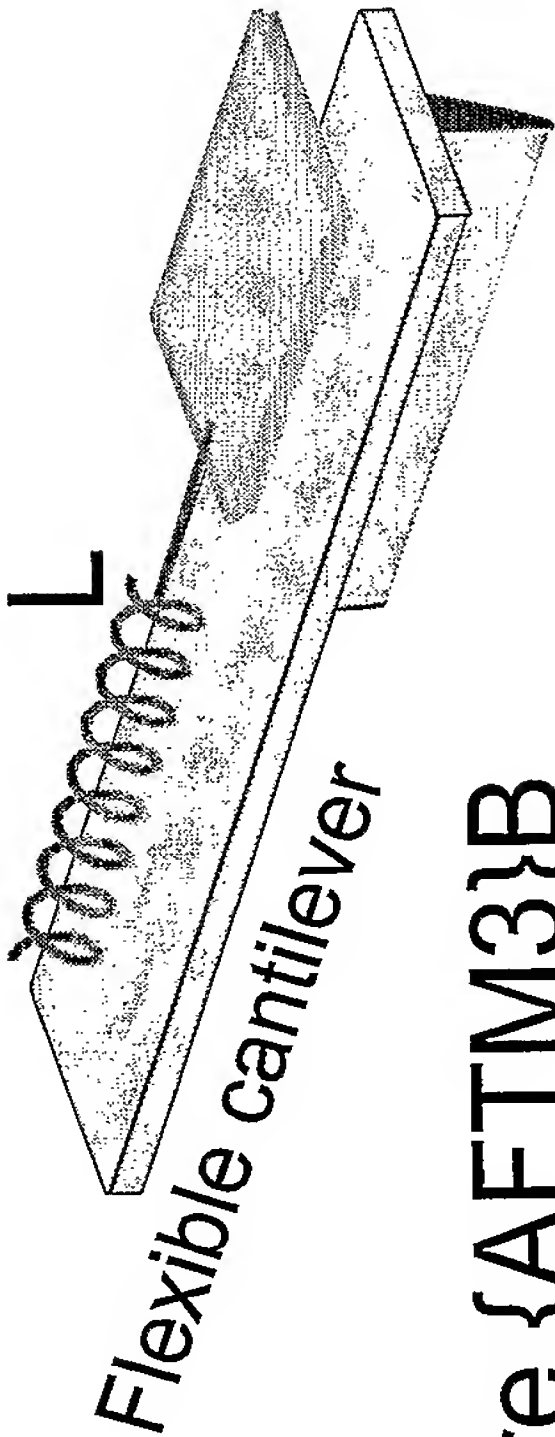
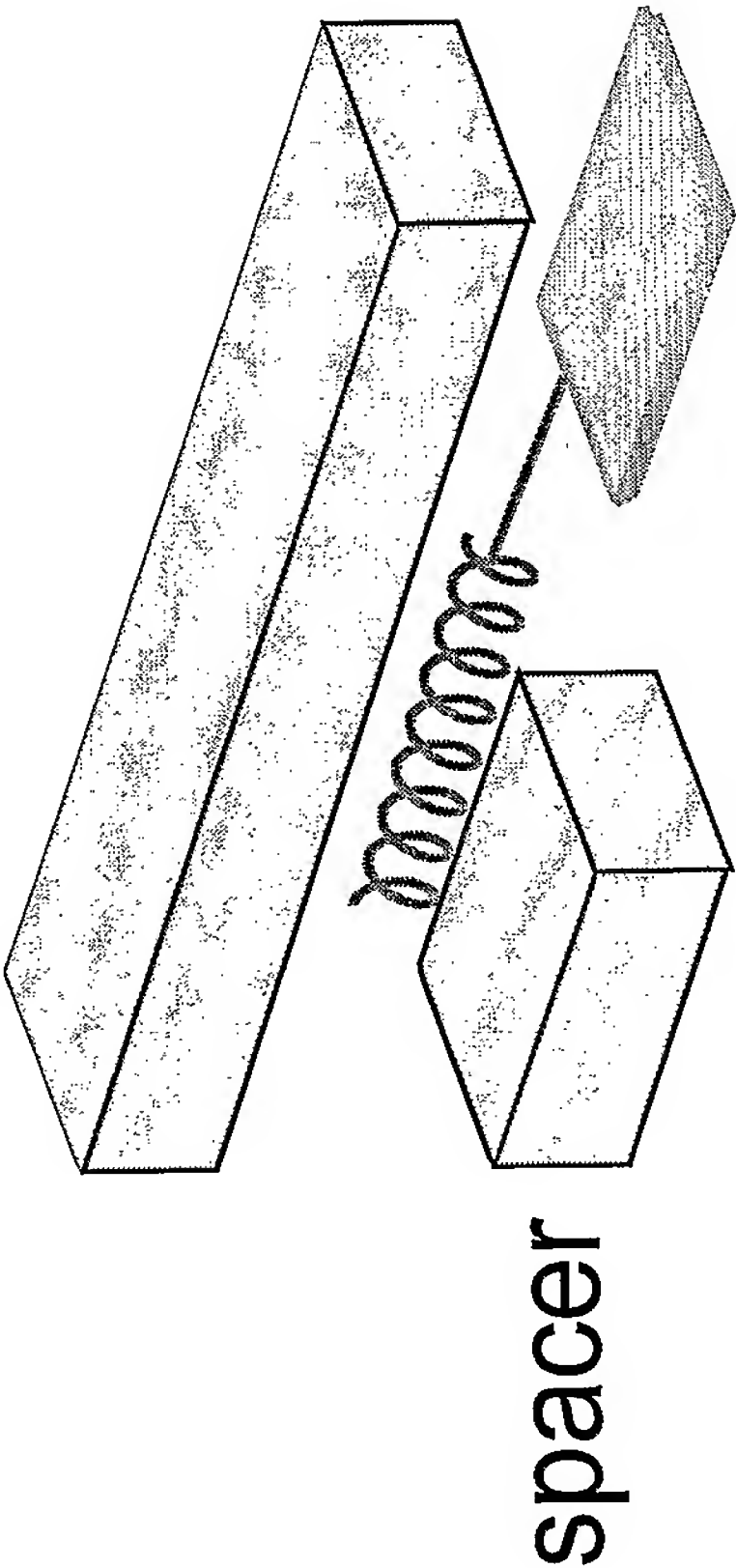


Figure {AFTM3}B

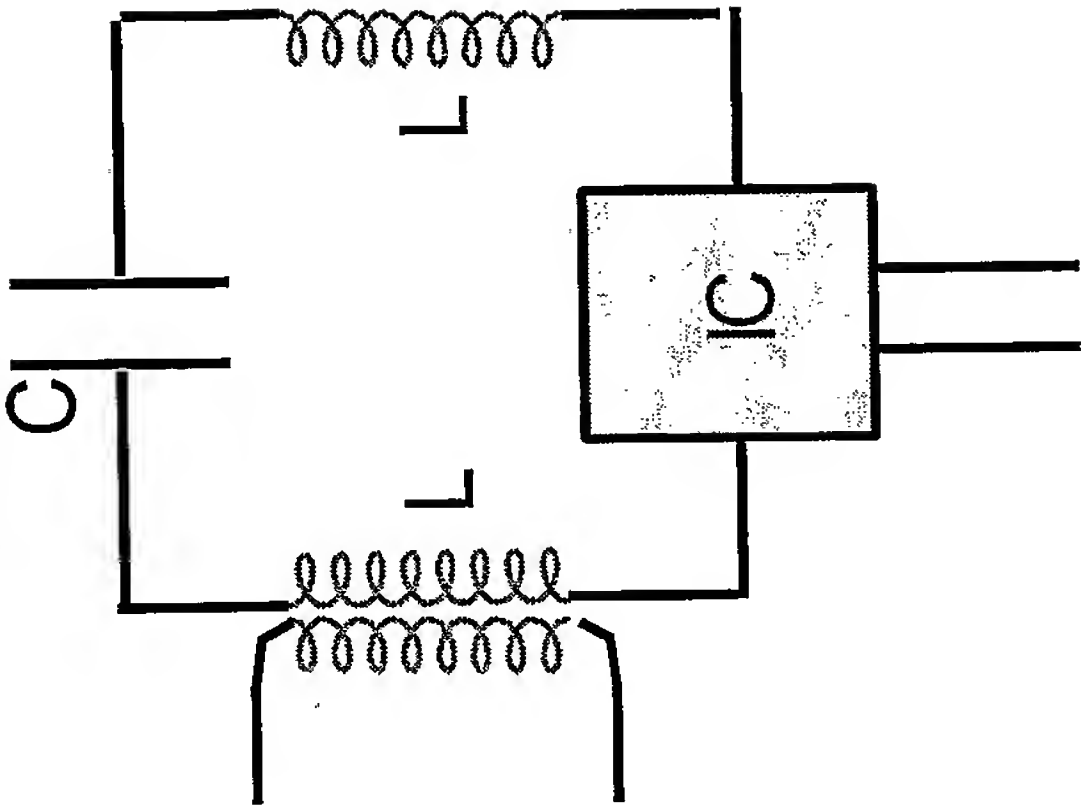


Figure {AFTM3}C

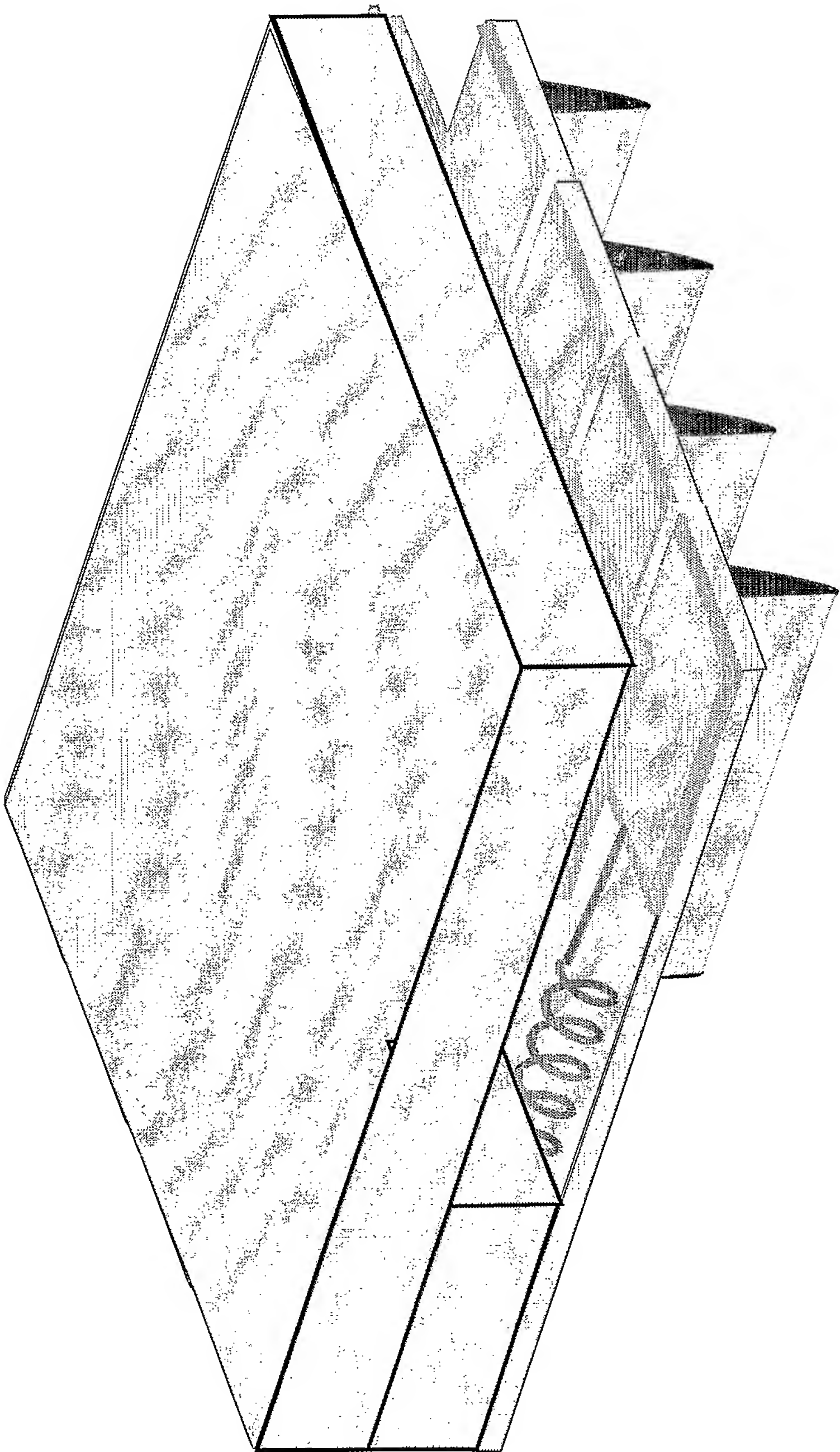


Figure {AFTM4}

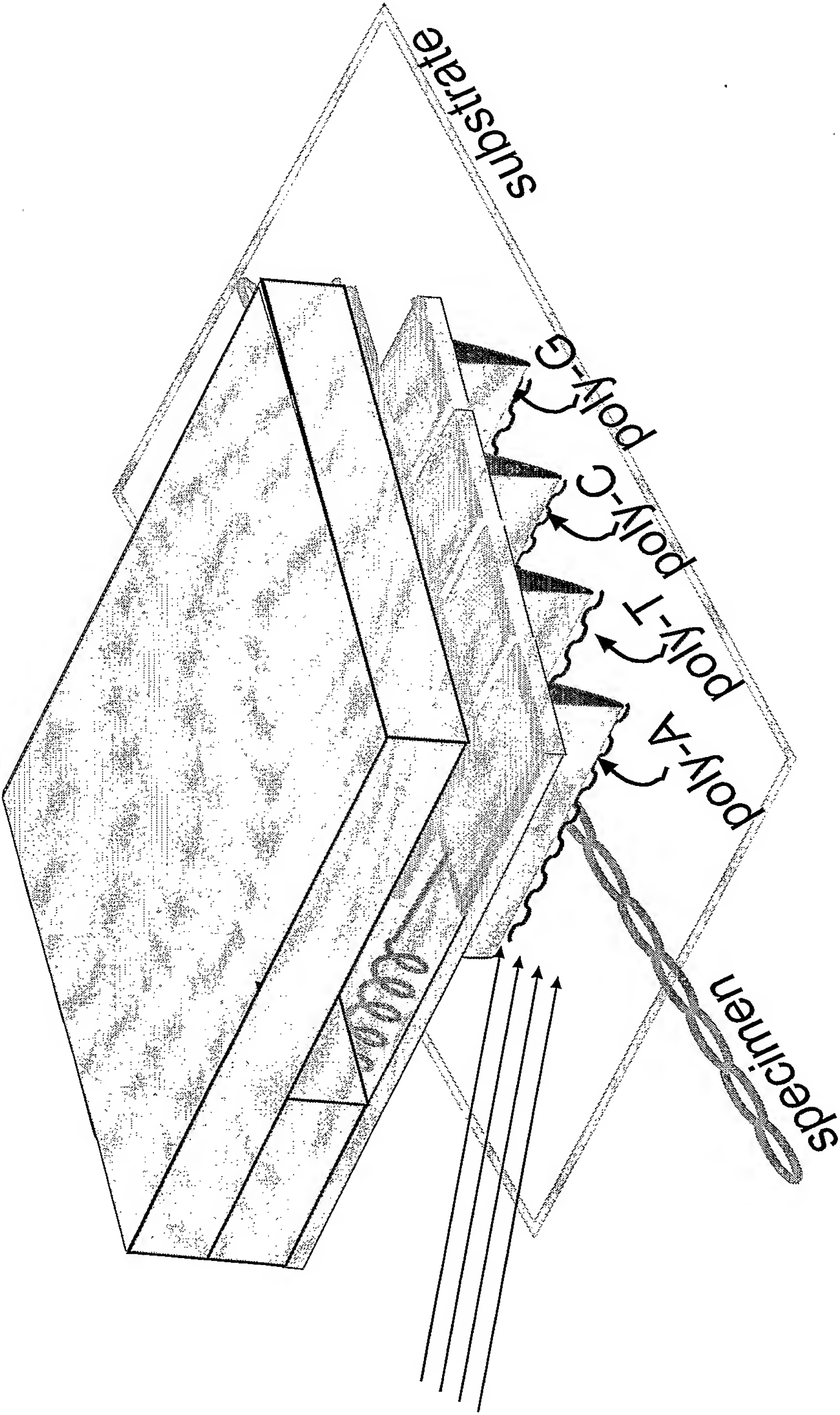


Figure {AFTM5}

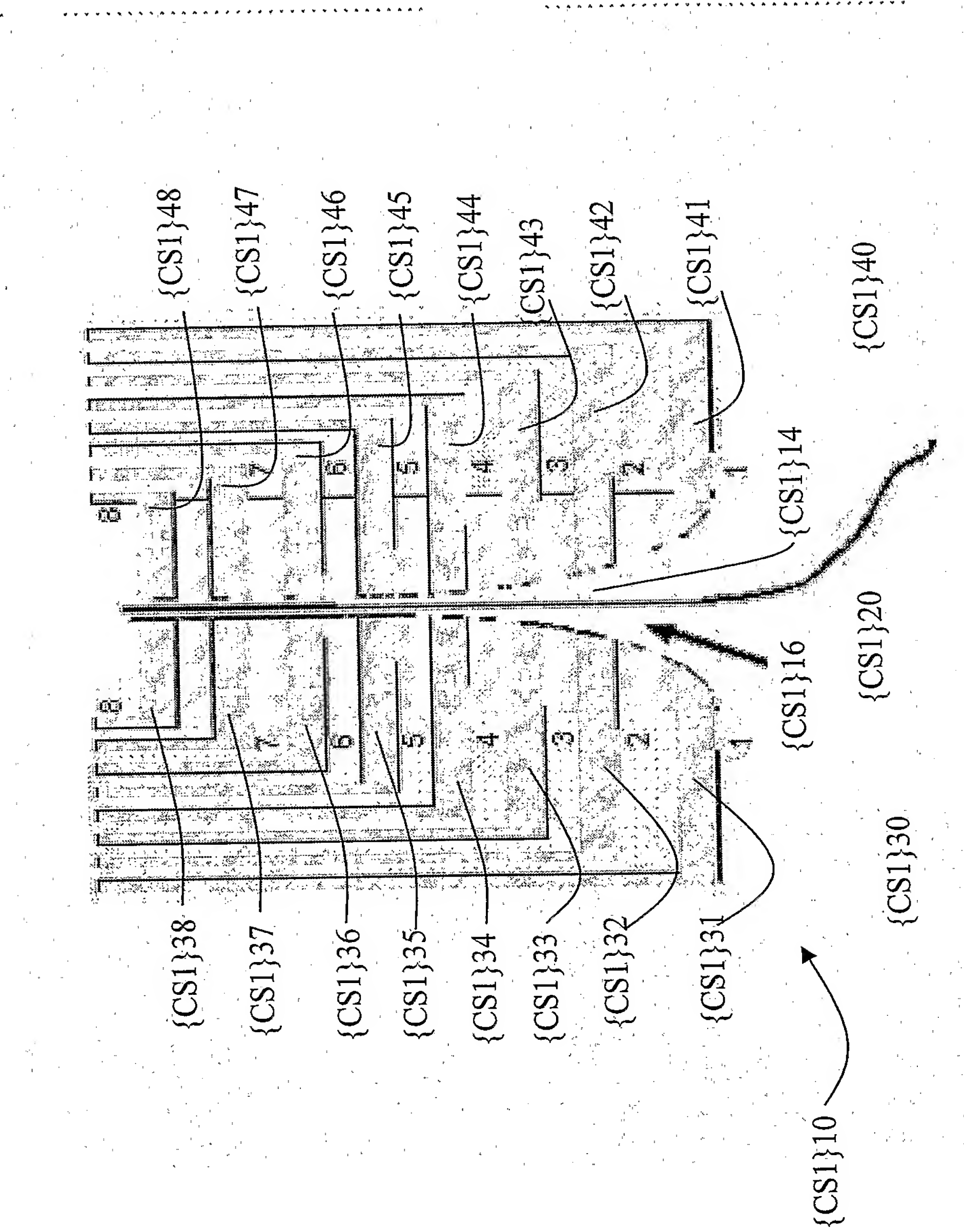


Figure {CS1}

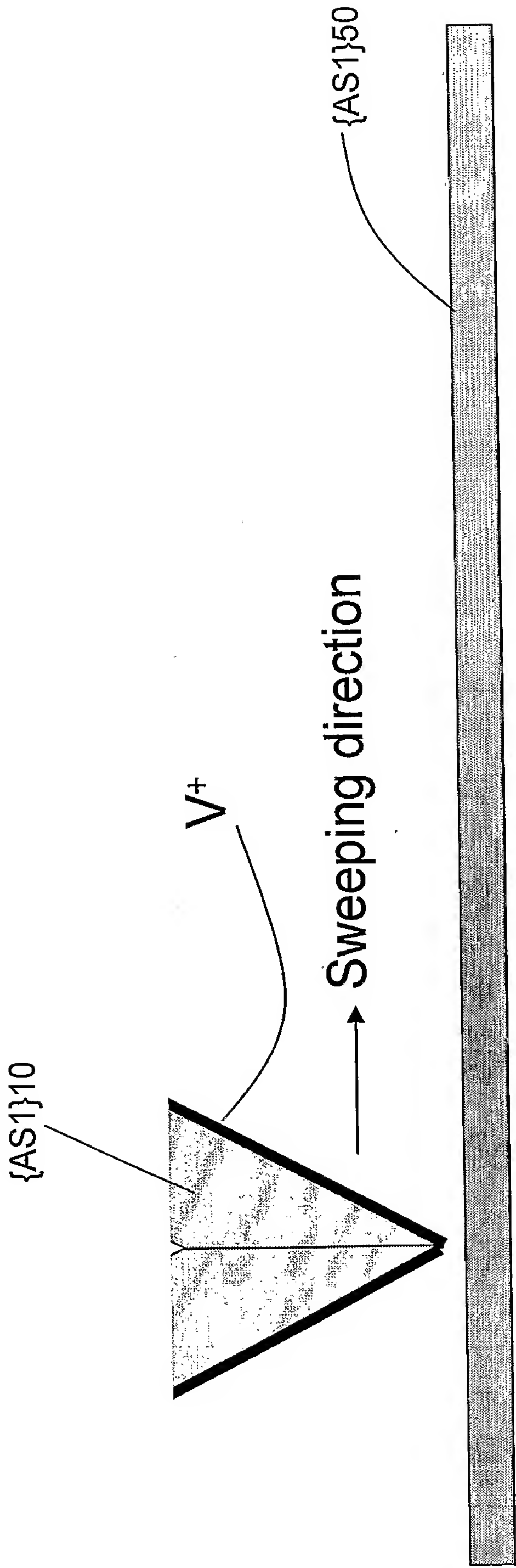


Figure {AS1}

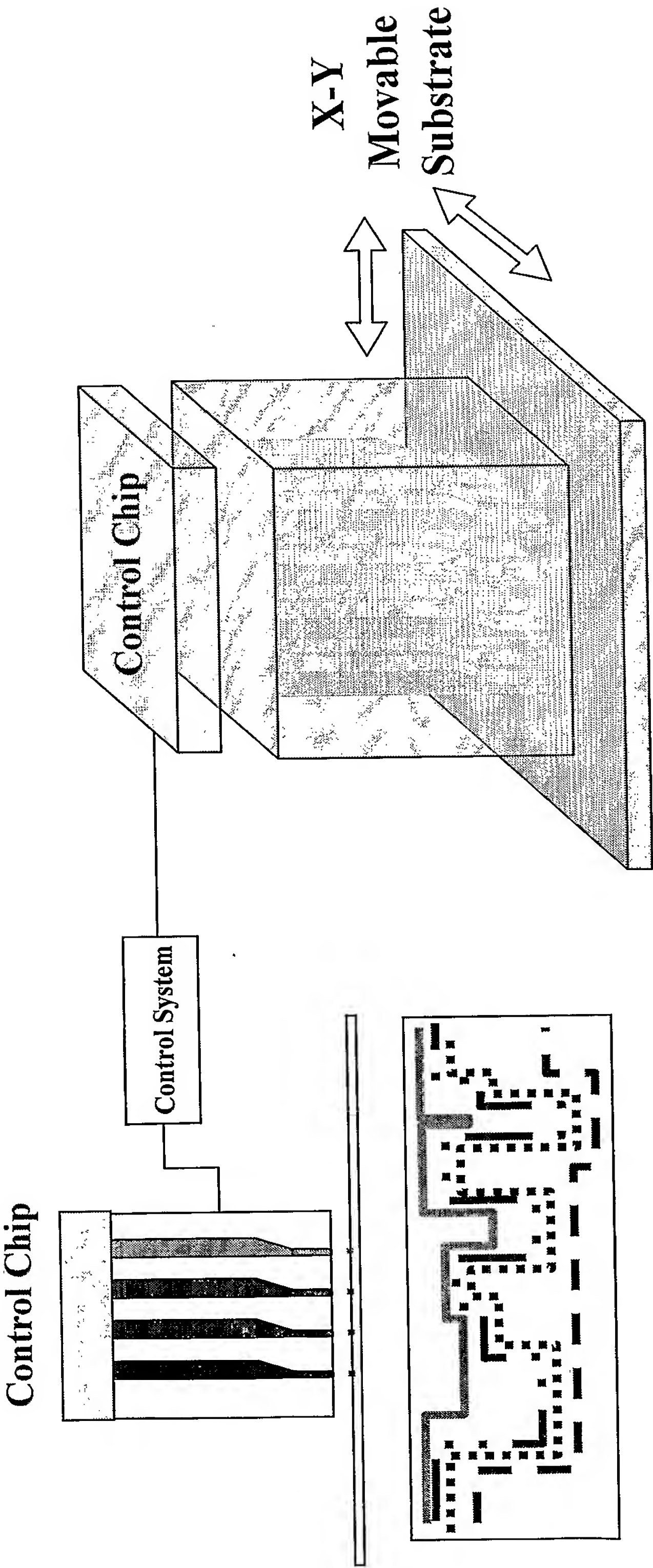


Figure {LITH1}

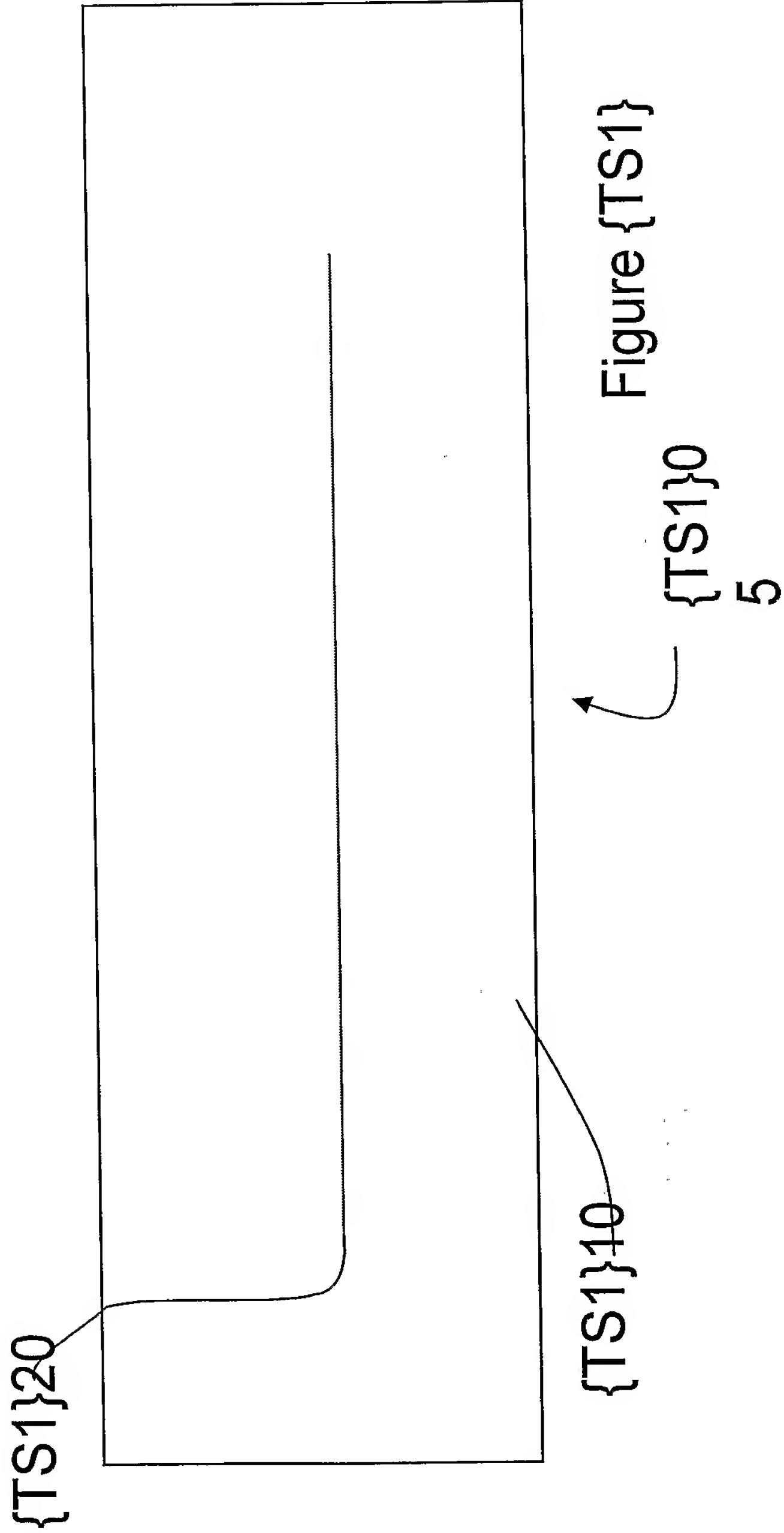


Figure {TS1}

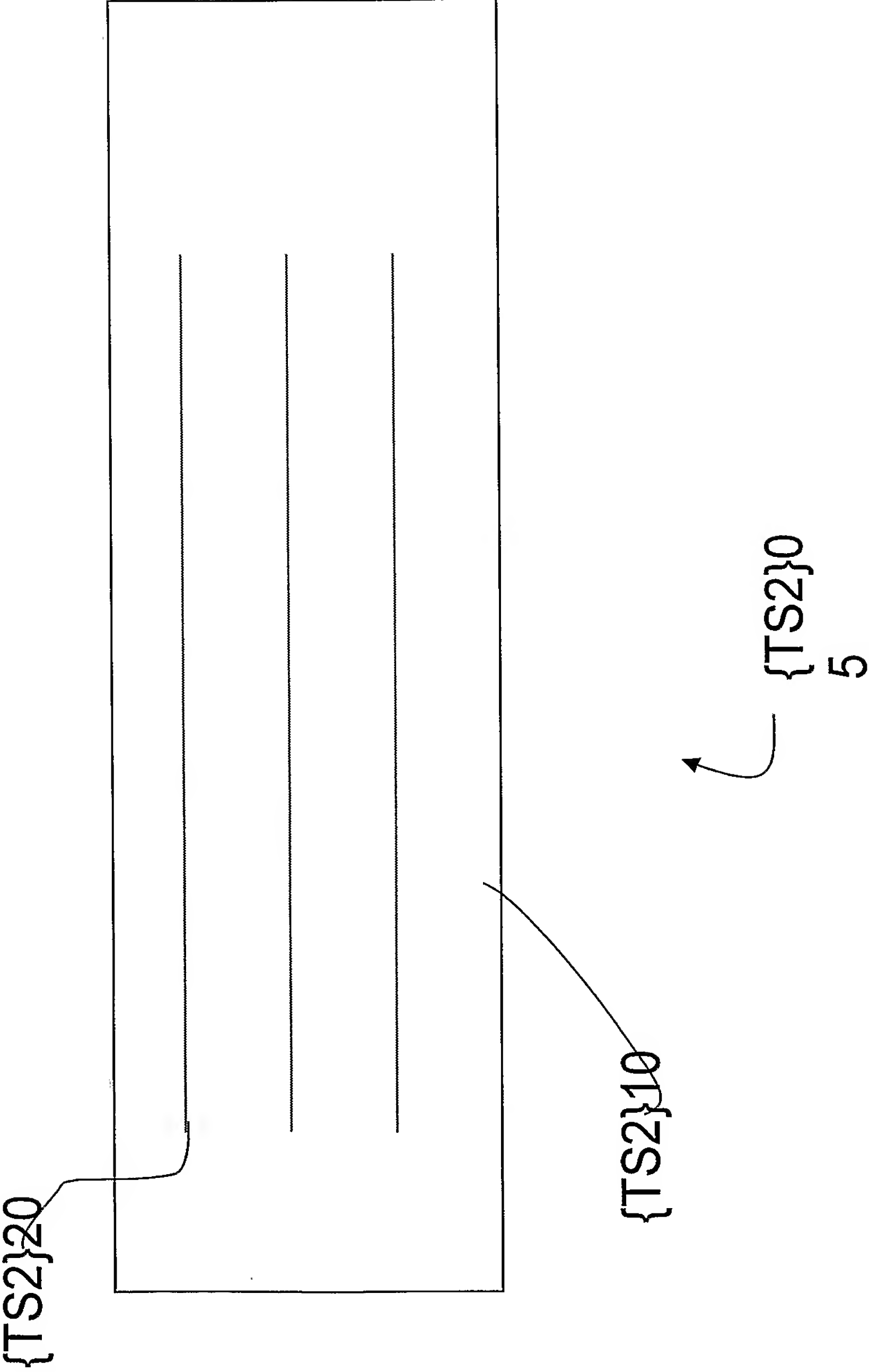


Figure $\{TS2\}$

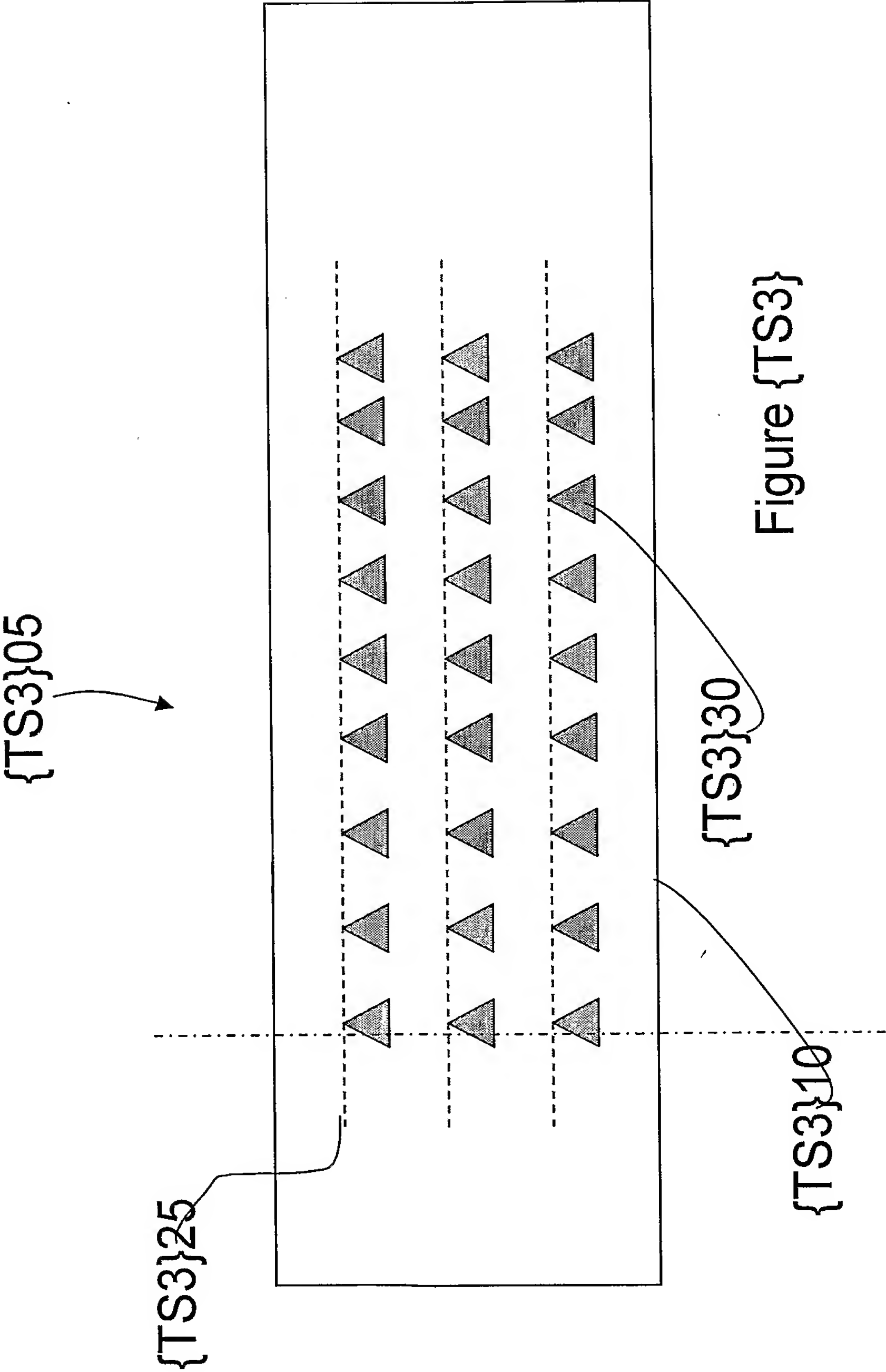
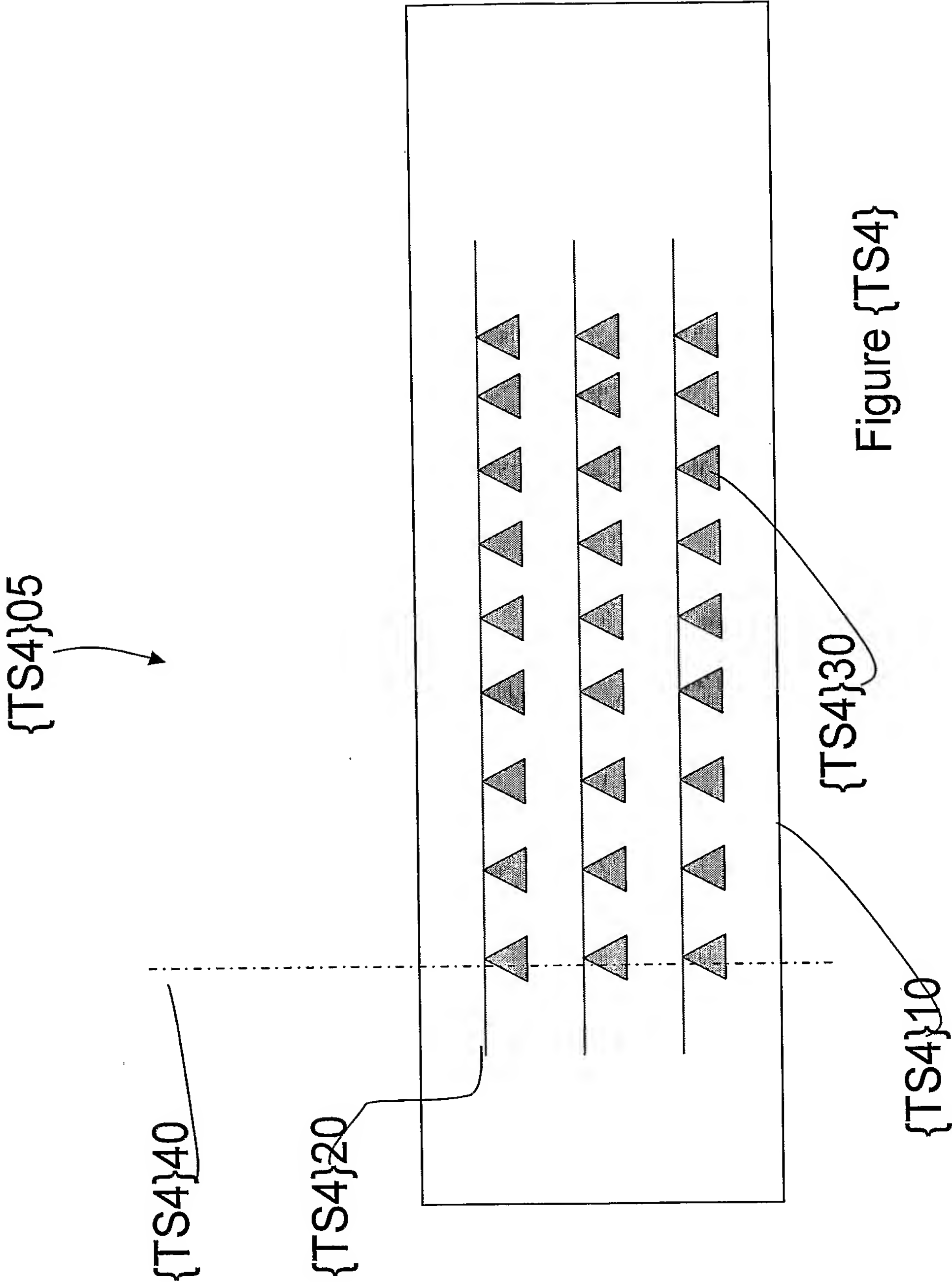


Figure {TS3}



{TS4}05

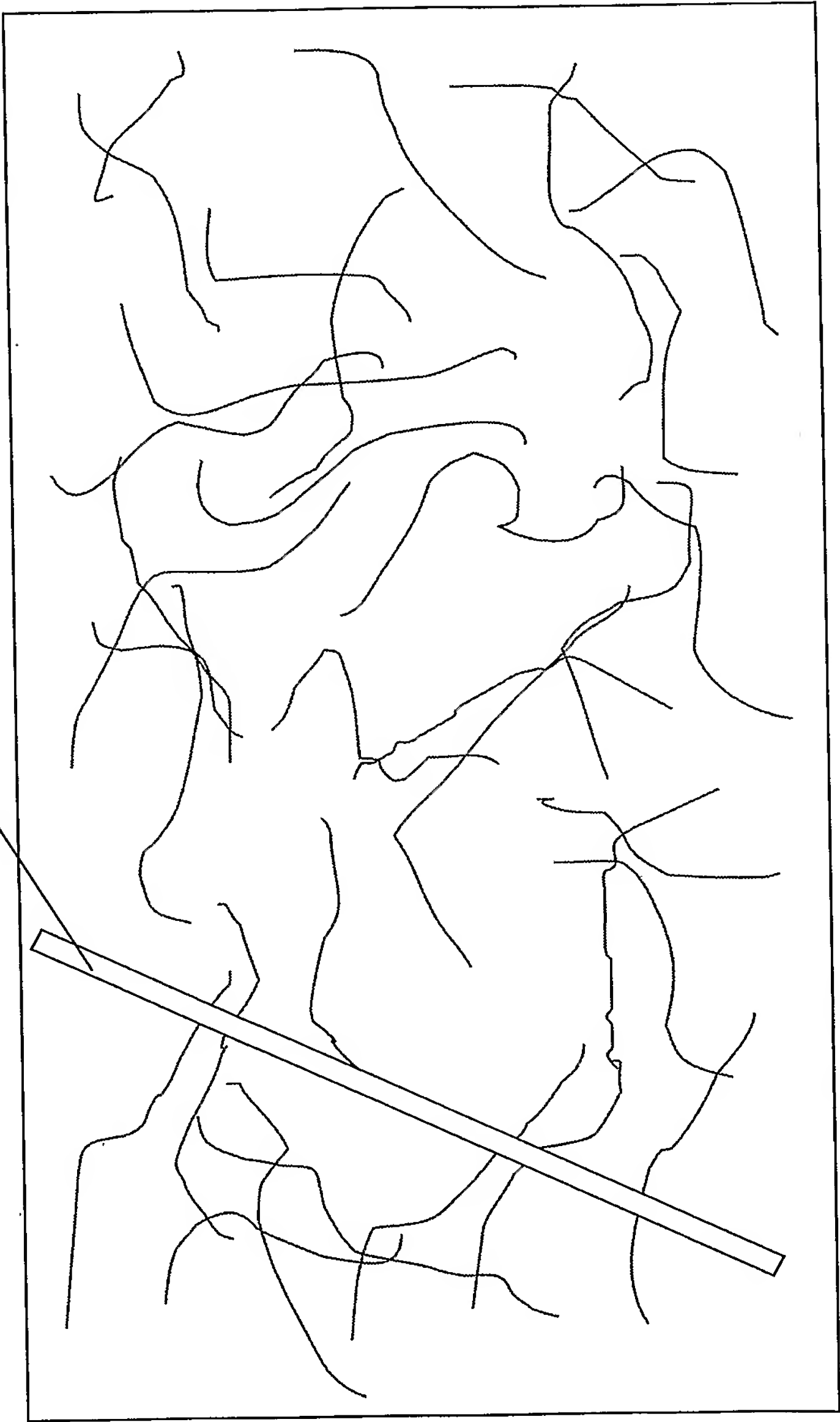


Figure {TS5}A

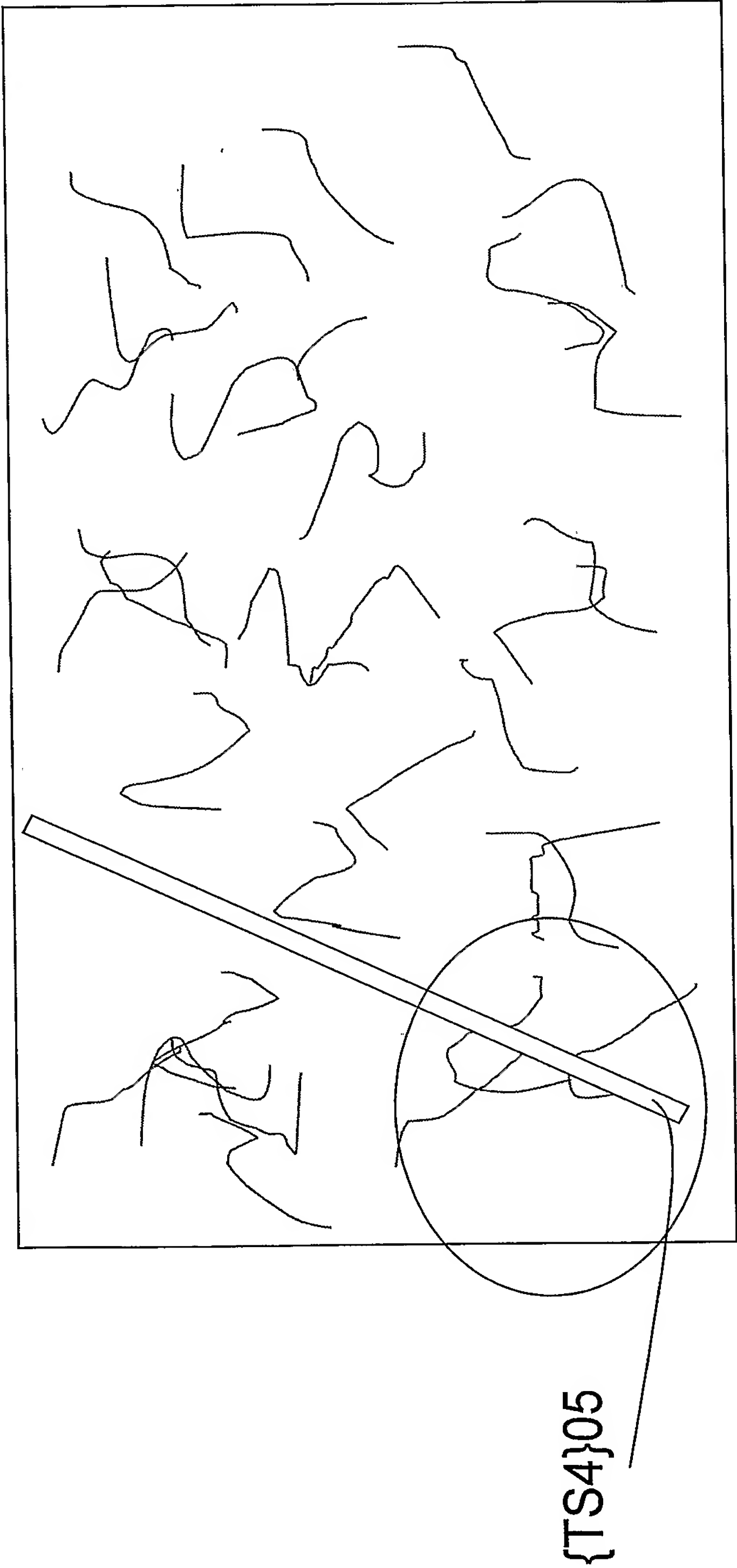
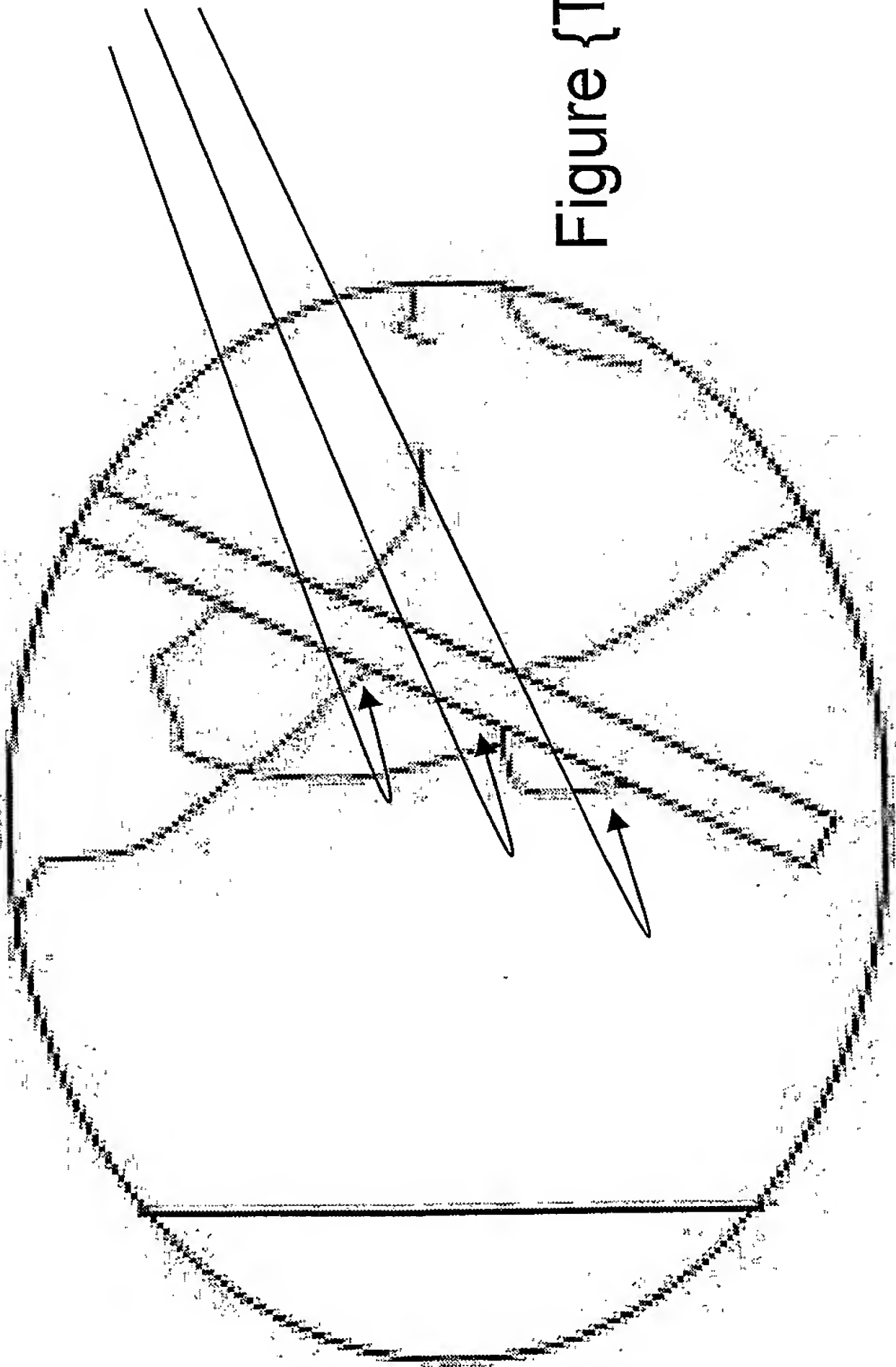


Figure {TS5}B



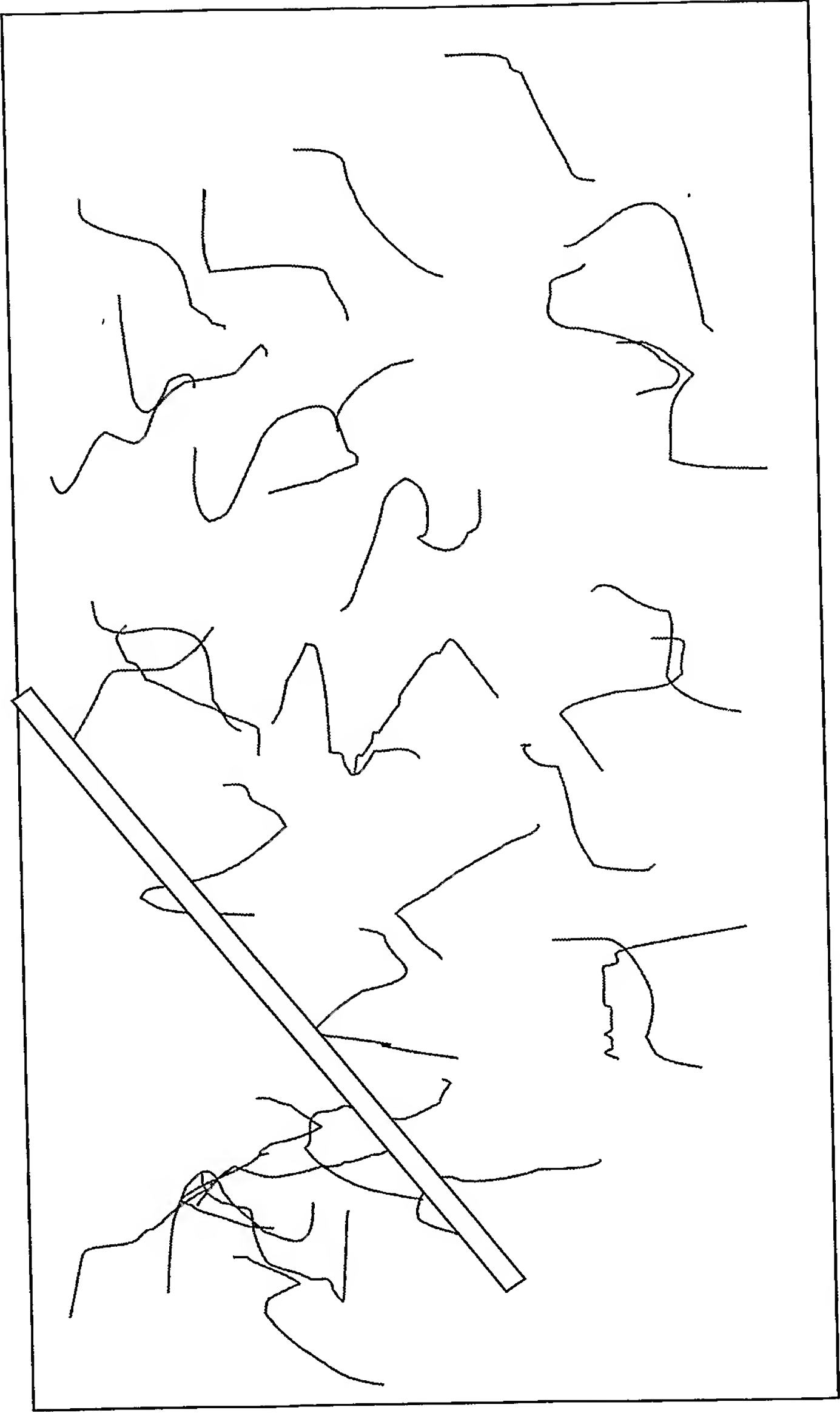


Figure {TS5}D

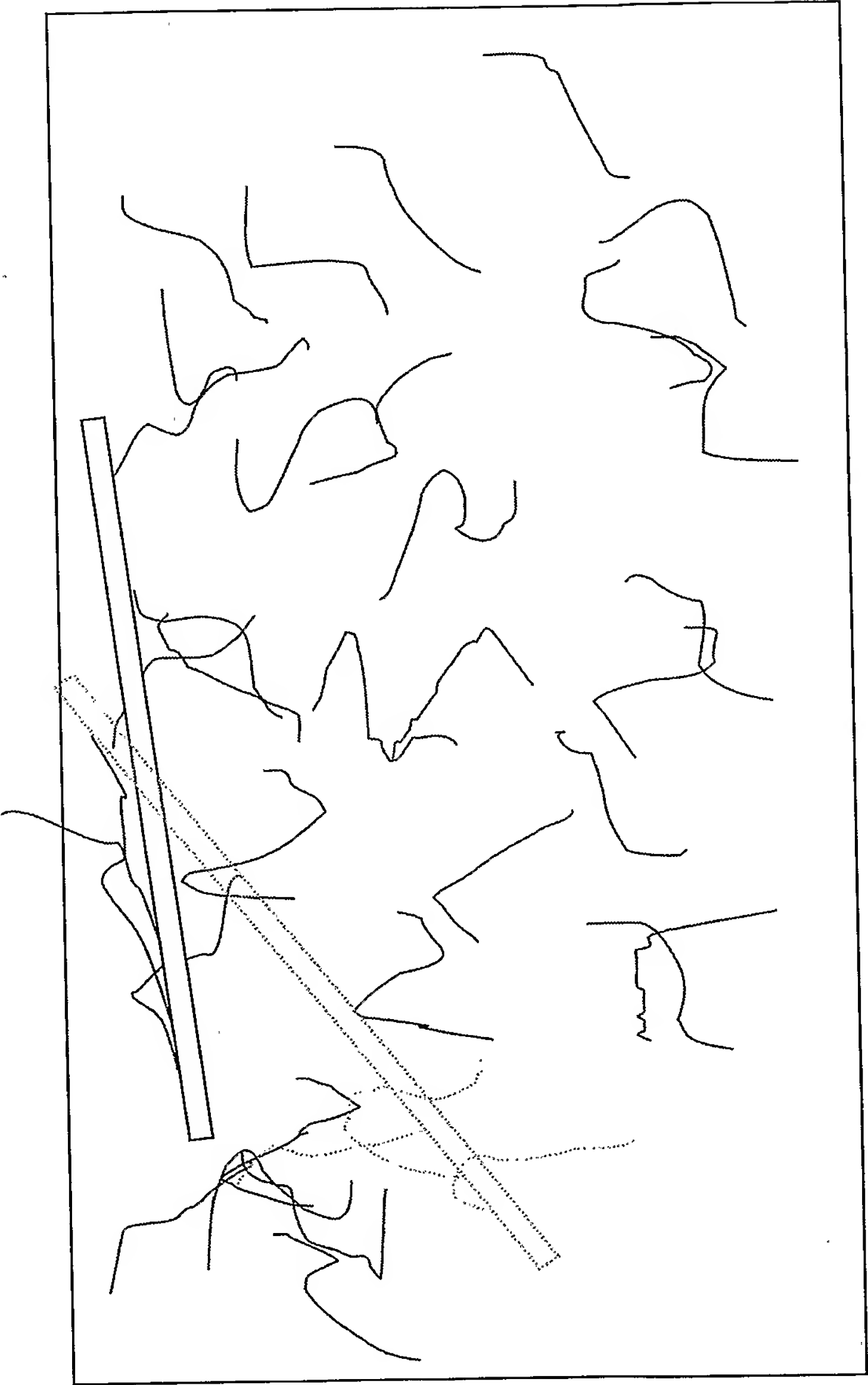
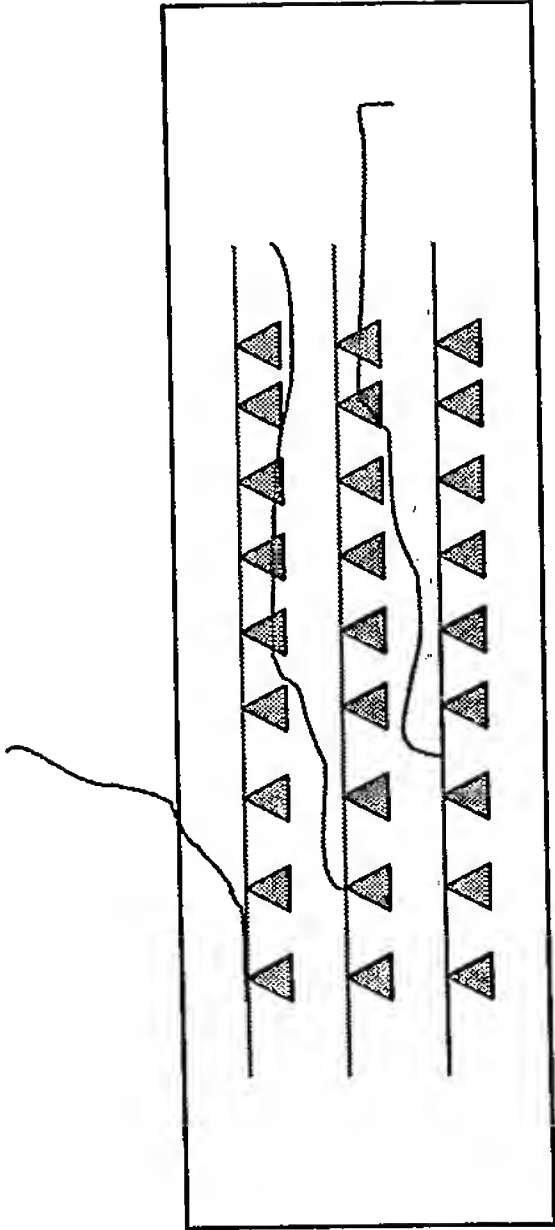


Figure {TS5}E



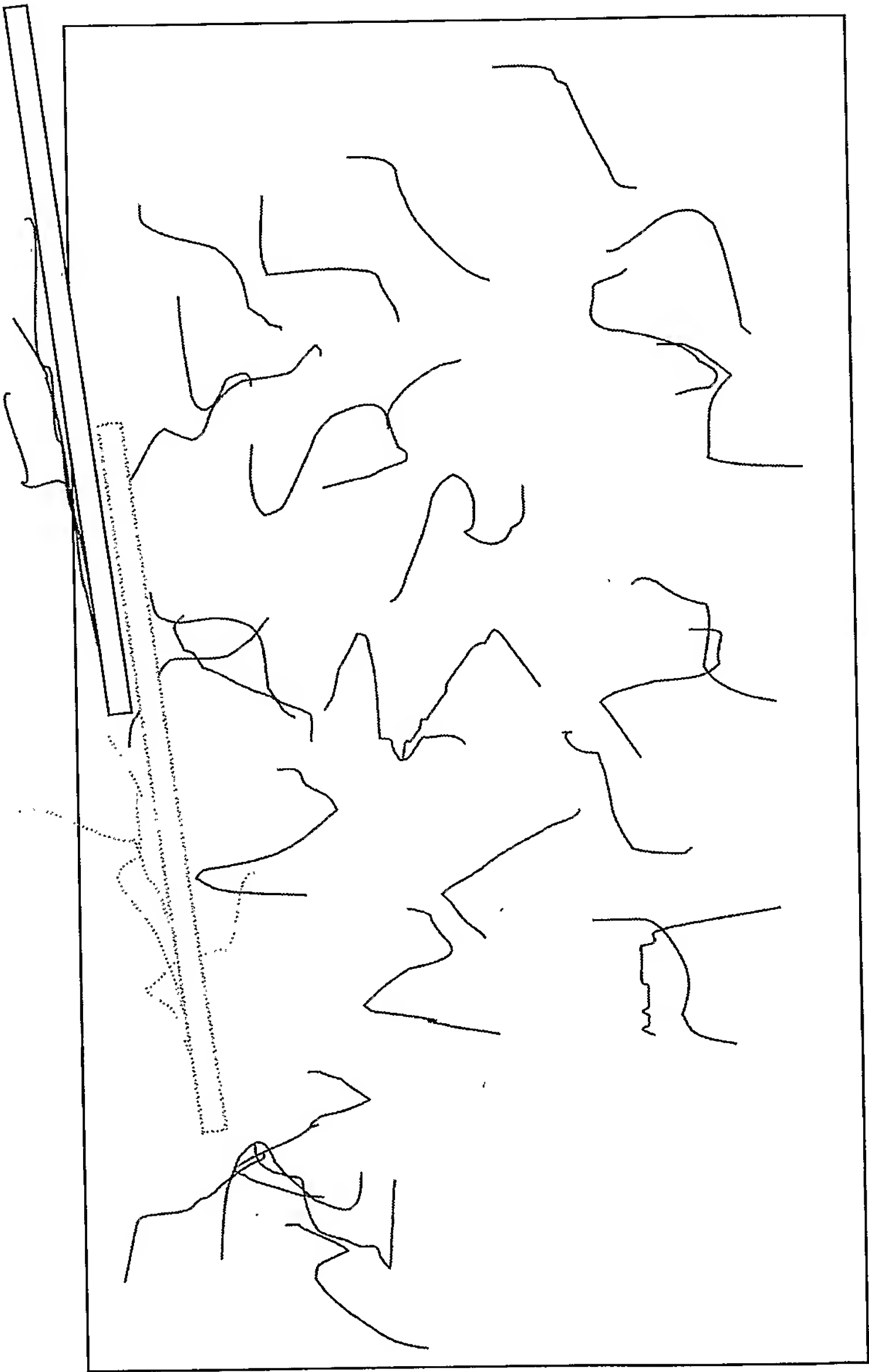
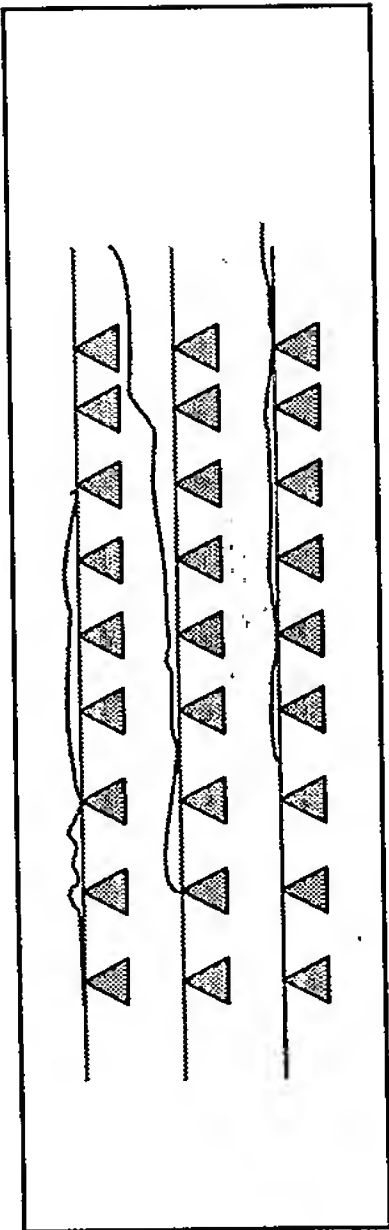


Figure {TS5}F



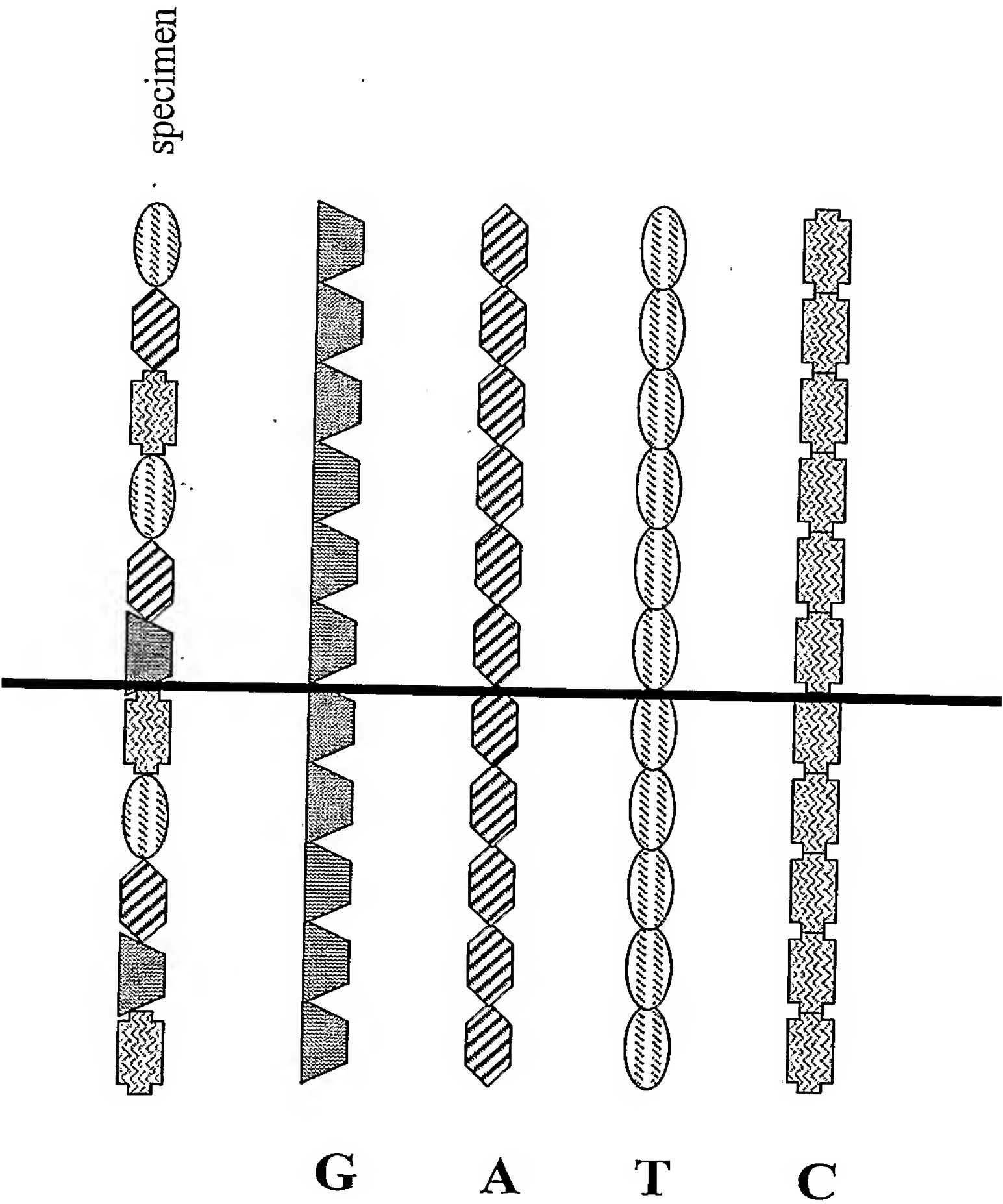


Figure {DD1}